

Summer 1994

Taxes and Dividend Policies: An International Study

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TAXES AND DIVIDEND POLICIES: AN INTERNATIONAL STUDY

by

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**A Dissertation submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirement for the Degree of**

Doctor of Business Administration

(Finance)

**Old Dominion University
August, 1994**

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Abstract

TAXES AND DIVIDEND POLICIES: AN INTERNATIONAL STUDY

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Old Dominion University, 1994

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The tax effects hypothesis states that dividends have a negative impact on the value of a firm due to the preferential treatment given to capital gains over dividend income in some countries. This study tests the tax effects hypothesis in five countries: Australia, France, Germany, Japan and United States. The countries are selected because each had a significant tax law change within the period of study (1983-1991) and therefore provides an excellent opportunity for validation of this hypothesis.

The tax effects hypothesis is tested by first examining the effects of tax law changes on dividend payout ratios and then by studying the relationship between expected return and dividend yield before and after a tax law change in each country. A modified Capital Asset Pricing Model is used in examining this relationship.

Dividend payout ratios, dividend yields and dividend growth rates are calculated for each country to check if there are significant differences across

countries. The final section of the study uses data in the five countries to test Lintner's partial adjustment model.

The results show that

1. There are some significant differences in payout ratios between the countries. The Australian and German firms have the highest dividend payout ratios while the French firms have the lowest dividend payout ratios. Australian firms also have the highest dividend yields and growth rates while Japanese firms have the lowest dividend yields and growth rates.
2. The post tax law dividend payout ratios of countries that increased the tax disadvantage of dividend income generally decreased. While the direction of the change in payout ratios supports the tax effects hypothesis, the amount of the change is insignificant in some cases.
3. A positive relationship between expected return and dividend yield is observed in countries that have higher effective tax rates on dividend income than capital gains. The relationship between expected return and dividend yield is positive and significant in France, Germany (after the tax law change), Japan and United States. An insignificant relationship is observed in countries that have similar tax rates on dividend income and capital gains. This is true for Australia and Germany (before the tax law change). These results suggest that dividends have a negative impact on the value of a firm and are consistent with the tax effects hypothesis.

4. Dividend behavior of firms in the countries can be explained by Lintner's model. The calculated payout ratios for Australia, France and U.S. are similar to the actual payout ratios. The calculated payout ratios for Germany and Japan are lower than the actual payout ratios but are within the calculated range of the payout ratios. Australia and Germany have the highest speed of adjustments among the five countries.

DEDICATION

This dissertation is dedicated to:

My Husband, Dr. Anthony C. Nweke,

My Children: Amaka, Charles, Tony and Chichi Nweke

My Sister-In-Law, Uchenna Nweke and

My Parents: Penninah and Hart Olekanma Adighmadu.

ACKNOWLEDGEMENTS

I wish to give special thanks to my graduate program advisor Dr. Bruce Seifert, for his advice, guidance and time given to this study, and for his encouragement throughout my graduate program. My thanks and appreciation also go to my committee members: Dr. G. Noronha, Dr. E. Markowski and Dr. T. Mckee for their advice and time. I am especially grateful to Dr. Markowski for his suggestions and help in my statistical analysis.

I also thank Dr. Ziegenfuss of the Accounting Department for his help with operating the Disclosure World-Scope data base; the faculty, staff and students of the College of Business and Public Administration and the Department of Finance in particular for their support and help throughout my graduate program.

Special thanks go to my husband, children and sister-in-law for their patience, encouragement, support and love throughout the many years of my education.

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Chapter 1

THE RESEARCH PROBLEM

I. Introduction

The effect of dividend policy on the value of a firm continues to be a controversial topic in finance. The irrelevancy theory made popular by Modigliani and Miller (1961) says that in a perfect market, the dividend policy of a firm given its investment policy is irrelevant to the value of the firm. The relevancy theory says that dividends have an effect on the value of a firm, but there is no consensus on the nature or the source of this valuation effect.

The "bird-in-hand" fallacy says that investors' need for current income or dislike for uncertainty causes a firm's stock price to be positively related to its current dividend. This argument suggests that dividends have a positive effect on the value of a firm.

The information effects hypothesis also suggests that dividends have a positive effect on the value of a firm. However, the positive effect in this case results from information asymmetry between investors and managers. Managers use dividend payments to inform investors about the earnings prospects of a firm.

The tax effects hypothesis, however, indicates that dividends have a negative impact on the value of a firm if dividends are taxed at a higher rate than capital gains. The negative impact arises from the differential tax treatment between dividend income and capital gains in countries that tax dividends at a higher rate. Wealth maximizing investors therefore demand higher returns from stocks that pay high dividends as a compensation for the higher taxes paid.

II. Purpose of the Study

The purpose of this research is to examine the tax effects hypothesis in five countries namely Australia, France, Germany, Japan and United States. These countries are selected because of the unique tax systems they adopted and because each had a significant tax law change within the period of study, 1983-1991. These tax law changes provide a unique opportunity for evaluating the validity of the tax effects hypothesis. This is achieved by first examining the effects of a tax law change on dividend payout ratios and then by studying the relationship between expected return and dividend yield before and after the tax law change in each country. The final section of this study uses data in the five countries to test Lintner's partial adjustment model.

III. Importance of the Study and Statement of the Problem

Dividend policies of firms are very important because of their significant impact in the private and business sectors. A major objective of shareholders

and management is maximization of shareholder's wealth. If dividend policy affects the value of a firm, it is only rational that shareholders and management should strive to adopt the dividend policy that maximizes the value of the firm. A firm's dividend policy is also important to shareholders because dividend income is a major source of income to some investors. These investors are therefore affected by the dividend policies adopted by firms.

Firms' dividend policies can also affect the economy. Retained earnings constitute a major source of long-term growth in many corporations and retained earnings are affected by dividend policies. Dividend policies can therefore have a stabilizing effect on the economy through its effect on the long-term growth of firms. This is especially true if external financing is unavailable or limited.

However, there is no conclusive evidence on the effect of dividend policy on the value of a firm. The irrelevancy theory says that dividend policy does not affect the value of a firm. The information effects hypothesis suggests that dividends have a positive effect on the value of a firm while the tax effects hypothesis says that dividends have a negative effect on the value of a firm (see literature review in Chapter 2). These contradictory hypotheses leave an important question in corporate finance still unanswered. Is the dividend policy of a firm relevant or irrelevant to the value of the firm?

One common problem with previous dividend studies is the difficulty of controlling for other relevant factors while examining the effects of dividend

policy on the value of a firm. This study minimizes this problem by working with countries that changed their tax system within the period of study. The relationship between dividend policy and the value of the firm is examined before and after a tax law change using the same group of firms.

Scarcity of data has also limited research in international dividend policies. The few international dividend studies that are in the literature do not specifically address valuation effects. This work adds to the literature by evaluating the tax effects hypothesis and by providing comparative dividend analysis on five countries including the U.S.

The world capital markets are becoming more integrated. Foreign markets are opening up to international investors. Companies are listing their stocks in foreign markets. Investors are now able to invest in foreign stocks at reasonable costs and with less government interference. These recent developments have necessitated the expansion of our knowledge on the relationship between dividend policy and the value of a firm in other economies. It is therefore important that dividend policies of other countries be studied.

IV. Scope of the Work

This study is directed at the following questions:

1. Are there significant differences in average dividend payout ratios, dividend yields and dividend growth rates between Australia, France, Germany, Japan and United States?

2. What are the effects of a tax law change on dividend payout ratios in each country?
3. Can the tax effects hypothesis be used to explain the relationship between dividend policy and the value of a firm?
4. Can Lintner's partial adjustment model be used to describe dividend behavior of firms in the five countries?

V. Theoretical Framework

A firm's dividend policy determines what proportion of the company's profit is paid out to shareholders. A firm can have a policy of paying all, none or a fraction of its earnings as dividends. Different hypotheses have been used to explain the effect of dividend policy (if any) on the value of a firm. The different hypotheses are discussed in the next section.

The Irrelevancy theory says that in a perfect market, the dividend policy of a corporation, given its investment policy, has no effect on its stock price. This means that dividends are irrelevant to the value of the firm. Modigliani and Miller (M & M) 1961 support the irrelevancy theory by deriving an equation that gives the value of a firm as:

$$V_i(t) = \frac{NOI_i(t+1) - I_i(t+1) + V_i(t+1)}{1 + p(t+1)} \dots\dots\dots 1$$

where $V_i(t)$ is the market value of the firm in period t ,

$NOI_i(t+1)$ is the random future cash flows from operations for

the i th firm at time $(t+1)$,

$I_i(t+1)$ is the investment outlay for the i th firm at time $(t+1)$,

$V_i(t+1)$ is the value of the firm at time $(t+1)$ and

$p(t+1)$ is the market-required rate of return at time $(t+1)$.

This equation implies that neither dividends nor any variable that affects dividends are relevant in the valuation of a firm. The value of a firm is the discounted value of future earnings. Dividends do not affect earnings and therefore should not affect the value of a firm. The future earnings of a firm depend on previous investment decisions.

The assumptions underlying this irrelevancy argument are:

1. There are no taxes. Firms' earnings are not subject to corporate or personal taxes.
2. There are no transaction costs. Shareholders can easily buy or sell shares without incurring any transaction costs.
3. There are no agency problems. The separation of management and ownership is no problem because management always acts in the best interest of the shareholders.
4. There is no information asymmetry. Management and shareholders have access to the same information.
5. The investment and financing decisions of corporations are exogenous to dividend policy. A firm that pays out all its earnings can still carry out profitable investments by borrowing from the capital market.

The opponents of the irrelevancy theory question the validity of these assumptions. Firms and investors pay taxes on their earnings; investors do not have the privilege of buying or selling shares without incurring transaction costs; and sometimes there are conflicts of interest between management and shareholders. Furthermore, investors and management do not always have access to the same information and even if they do, investors do not always understand the information they receive from the financial market. Finally, M & M's assumption that investment decisions are independent of dividend policy has also been questioned. Adoption of residual dividend policy by some firms (whereby all positive Net Present Value projects are financed before any dividends are paid), implies that investment and dividend policy decisions are not completely independent of each other. Myers and Majluf (1984) argue that firms prefer to finance new investment with internal funds instead of external funds that would expose the firm to scrutinies of the capital market. This suggests that there are some interactions between dividend policies, investment policies and other financing policies. These doubts led to the advancement of other hypotheses such as the information effect hypothesis, agency cost hypothesis, and tax effects hypothesis in addition to the existing "bird-in-hand" fallacy.

The "bird-in-hand" fallacy suggests that the need for current income or resolution of uncertainty causes a firm's stock price to be positively related to its current dividend. Firms that pay high dividends attract investors and the

increased demand for shares drives up stock prices. This implies that current dividends are better than uncertain future capital gains that may never be realized. This view was prevalent before Modigliani and Miller (1961).

The information asymmetry hypothesis says that dividends are relevant because they are used by management to communicate privileged information about a firm's performance to shareholders. It is the expectation of higher current or future earnings that raises stock prices and not necessarily shareholders' preference for high dividends.

The Agency theory uses the conflict of interest between owner-managers and outside investors to explain the valuation effects of dividends. Rozeff (1982) suggests that an optimal dividend policy can be explained by a trade-off between floatation costs of raising external capital and the benefit of reduced agency costs. Agency cost arises when prospective investors charge, ex ante, for the possibility that owner-managers may increase their personal wealth through perquisites at the expense of investors. Owner-managers sometimes choose to minimize these agency costs by incurring monitoring costs if such costs are less than what prospective investors charge.

The tax effects hypothesis says that dividends have a negative impact on the value of a firm. The basis of this argument is the differential tax treatment between dividend income and capital gains. In countries where dividend income is taxed at a higher rate than capital gains, investors in some tax brackets may not maximize their after-tax return if they earn dividend income.

These investors therefore demand higher returns as a compensation for the higher taxes paid on dividend income. This implies that high dividends have a negative effect on the value of a firm. This study focuses on the validation of the tax effects hypothesis.

Chapter 2

REVIEW OF LITERATURE

The literature review is divided into four sections:

1. Country comparative dividend studies
2. Effects of tax law changes on dividend payout ratios
3. Tax effects hypothesis on the value of a firm and
4. Behavioral dividend partial adjustment models.

I. Country Comparative Dividend Studies

Two studies that compare dividend policies of different countries are Khoury and Smith (1977) and Michel and Shaked (1986). Khoury and Smith compare the dividend policies of Canadian and U.S. firms. They conclude that U.S. firms generally have higher payout ratios and dividend yields than Canadian firms. Michel and Shaked examine country and industry influences on dividend policies in Japan and U.S. They find that dividend yields of U.S. firms are generally higher than dividend yields of Japanese firms, while the dividend payout ratios of Japanese firms are higher than those of U.S. firms. These two studies indicate that there are differences in dividend payout ratios

across countries.

II. The Effects of Tax Law changes on Dividend Payout Ratios

Khoury and Smith (1977) examine the effects of the 1972 Canadian Fiscal Tax Reform Act on dividend policies of Canadian firms. The Fiscal Reform Act is a tax law change that introduced a capital gains tax and increased the dividend tax credit in Canada. This tax law change made dividends more attractive relative to capital gains for most investors. Khoury and Smith compare the pre and post tax law means of dividend growth rates and conclude that there is a significant difference between the two means. Dividend growth rates increased from a pre-law average of 5% to a post-law average of 10.01%. This indicates that Canadian firms increased the amount of dividends paid after the tax law change. A similar comparison for the U.S. sample, where there was no tax law change, did not reveal any significant difference between the pre and post tax law means.

Morgan (1980) also studied the effect of the differential tax treatment of dividends and capital gains after the 1972 Canadian tax law change. He concludes that Canadian investors regarded dividend income and capital gains as imperfect substitutes before the tax law change (i.e. capital gains were preferred to dividend income). After the tax law change, the two were regarded as perfect substitutes suggesting that people were indifferent to receiving dividend income or realizing capital gains. This again implies that the tax law

change affected dividend behavior of Canadian investors.

Ben-Horim, Hochman and Palmon (1987), Abruntyn and Turner (1990), Gordon and Mackie-Mason (1990) and Bolster and Janjigian (1991) examine the impact of the 1986 U.S. Tax Reform Act on dividend payout ratios.

Ben-Horim, Hochman and Palmon (1987), in a theoretical paper, predict that payout ratios should increase after the tax law reform because of the elimination of capital gains tax advantage. Abruntyn and Turner (1990) and Bolster and Janjigian (1991) find no significant difference between the pre and post tax law dividend payout means. Gordon and Mackie-Mason (1990), however, conclude that the mean payout ratios increased after the tax law change.

Khoury and Smith (1977), Gordon and Mackie-Mason (1990) and Ben-Horim, Hochman and Palmon (1987) suggest that changes in tax laws affect dividend payout ratios. None of the above studies, however, adjusted for macro-economic effects. This study adjusts for macro-economic influences in examining the effect of tax law changes on dividend payout ratios.

III. The Effects of Dividend Policies on the Value of a Firm

Irrelevancy and relevancy are the two main theories on the relationship between dividend policy and value of a firm.

A. The Irrelevancy Theory

The Irrelevancy theory says that the dividend policy of a corporation, given its investment policy, has no effect on its stock prices in a perfect market. Dividend policy is therefore irrelevant to the value of a firm. The argument underlying this theory was given in Chapter One. The two well-known studies that provide empirical evidence in support of the irrelevancy theory are Black and Scholes (1974) and Miller and Scholes (1982).

Black and Scholes (1974) test the relationship between the value of a firm and its dividend policy by using the Capital Asset Pricing Model. They argue that a firm that changes its dividend policy attracts as well as drives away potential investors based on different individual preferences for dividends. The net effect is that the policy change does not affect the firm's value. They conclude that returns on stocks with high dividend yields are not significantly different from those with low yields. Miller and Scholes (1982) also find there is no significant relationship between dividend yield and expected return. The dividend policy of a firm is therefore irrelevant to its value. Huberman (1990) relaxed the M & M's (1961) no transaction cost assumption and still concludes that dividends are irrelevant to shareholders' welfare.

B. The Relevancy Theory

The relevancy theory says that dividend policy affects the value of a firm, though there is no consensus as to the nature or source of this valuation effect.

Some argue that dividends have a positive impact on the value of a firm while others say that the impact of dividends on the value of a firm is negative.

(1). Positive Effects Argument: Early dividend studies by Graham and Dodd (1951), Gordon (1959) and Durand (1959) examine the relationship between dividend policy and value of a firm by regressing prices on aggregate dividends and retained earnings. The equation used by these studies is given as follows:

$$P_{i,t} = a + bDiv_{i,t} + cR_{i,t} + \epsilon_{i,t} \dots \dots \dots 2$$

where $P_{i,t}$ is the price per share for firm i in period t,

$Div_{i,t}$ is the aggregate dividends paid by firm i in period t,

$R_{i,t}$ is retained earnings for firm i in period t and

$\epsilon_{i,t}$ is the error term for firm i in period t.

They find significant positive coefficients on the dividend variable and conclude that there is a positive relationship between dividends and the value of a firm.

The results also show that the dividend coefficient is significantly higher than the retained earnings coefficient. Friend and Puckett (1964) used normalized earnings to run the regression and find that there is a positive relationship between prices and dividends. They, however, note that the difference between the dividend coefficient and the earnings coefficient is smaller when normalized earnings are used in the regression.

Long (1978) and Poterba (1986) examine the price behavior of two classes of shares issued by Citizens Utilities Company. The two classes were

identical in all aspects except for the type of dividend paid. One group paid cash dividends taxed at the investor's personal tax rate while the other paid stock dividends taxed at the capital gains rate. Both studies conclude that the price of the stock class that paid cash dividends was generally higher though Poterba finds that the two classes were priced equally in some periods.

Bailey (1988) also examines the price behavior of Canadian firms that issued two classes of stocks. One class paid cash dividends while the other realized capital gains. He concludes that equities that paid cash dividends sell at a premium in some periods. He, however, notes that there is no evidence to show that investors prefer cash income to equal amounts of capital gains.

(2). Information Effects Hypothesis: The information asymmetry hypothesis argues that the expectation of higher earnings and not necessarily shareholders' preference for high dividends raises stock prices. Empirical testing has established that prices of shares rise when there is an unexpected increase in dividends. Studies that provide empirical evidence in support of this information effects argument are Pettit (1972), Pettit (1976), Watts (1973), Laub (1976), Aharony and Swary (1980), Asquith and Mullins (1983), Woolridge (1983), Kane, Lee, and Marcus (1984), Hess, Eades and Kim (1985), Ofer and Siegel (1987), Lang and Litzenberger (1989), Elfakhani (1993) and Gweon, Lee and Shin (1993).

Fama, Fisher, Jensen and Roll (1969) examine the reaction of share

prices upon stock split announcements. They conclude that share prices increase when a stock split announcement is accompanied by an announcement of an effective increase in dividends. On the other hand, share prices decrease when a stock split announcement is accompanied by an announcement of an effective decrease in dividends.

Asquith and Mullins (1983) and Richardson, Sefcik, and Thompson (1986) examine a sample of firms that either paid their first dividends or initiated dividends after a 10-year break. Both studies find significant increases in stock prices on the day the initial dividend announcements were made.

Miller and Rock (1985) argue that dividend announcements under asymmetric information provide investors with information about the earnings ability of a firm. An unexpected increase in dividends is interpreted as management's way of communicating to investors that a firm's earnings are higher than expected. This good news drives up share prices and increases the firm's value.

Other theoretical papers that argue that prices of shares should rise when there is an unexpected increase in dividends are Watts (1973), Watts (1976), Bhattacharya (1979), John and Williams (1985), Ambarish, John and Williams (1987), Ofer and Thakor (1987) and Williams (1988).

(3). Agency Theory: Agency theory says that an optimum dividend policy can be established by a trade-off between floatation costs of raising external

capital and the benefit of reduced agency costs. Firms that pay a lot of dividends use external financing more often than those that pay smaller amounts of dividends and this results in high floatation costs. These firms, however, have low agency costs because they are monitored more often by the capital market. The advantage of low agency cost and the disadvantage of high floatation cost help determine an optimal dividend policy.

Rozeff examines the average dividend payout ratios of 1000 non-regulated firms in 64 industries between 1974 and 1980. He finds that dividend payout is negatively related to the percentage of insiders. The higher the percentage of insiders, the less the need to pay dividends to reduce agency costs, and vice versa. He also finds that the number of outside stockholders is positively related to dividend payout ratios (firms with a large number of outside stockholders pay out more dividends to reduce high agency costs). His other findings are that high growth firms and very risky firms have low dividend payout ratios. Dempsey and Laber (1992) provide evidence consistent with Rozeff (1982). They conclude that firms with low dividend payout ratios have fewer shareholders and higher systematic risk. Easterbrook (1984) argues that dividend payments force firms into the external markets where cost of monitoring managers is low. Crutchley and Hansen (1989) conclude that firms with higher expected floatation costs pay less dividends.

(4). Tax Effects Hypothesis: Proponents of the tax effects hypothesis argue that a firm's stock price may be negatively related to dividend yield if the tax rate on dividend income is higher than the tax rate on capital gains. This hypothesis therefore suggests that the stock price should be positively related to the dividend yield if the tax rate on dividend income is less than the tax rate on capital gains. If the tax effects hypothesis is correct, there should be a positive relationship between expected return and dividend yields for countries that have higher effective tax rates on dividend income than on capital gains and vice versa.

Litzenberger and Ramaswamy (1979), Litzenberger and Ramaswamy (1982), Brennan (1970), Stone and Barter (1979), and Rosenberg and Marathe (1979) examine the relationship between dividends and security returns using the Capital Asset Pricing Model. They find a positive relationship between expected return and dividend yield. Blume (1980) finds a U-shaped relationship between dividend yield and expected return. Stocks that pay no dividends and those that pay very large dividends provide the highest rate of return. Keim (1985) also finds a U-shaped pattern but only for the month of January.

Amoako-Adu, Rashid and Stebbins (1992) study the effect of the introduction of a \$500,000 capital gains tax exemption on stock prices in Canada and the reduction of this exemption to \$100,000 two years later by examining the price behavior of two groups of low and high dividend yield firms. They find that the introduction of the \$500,000 tax exemption increased stock

prices of the low dividend yield group (capital gains stock). The subsequent reduction in the capital gains tax exempt limit in 1987 resulted in an increase in stock prices of the high dividend yield group. This suggests that a security's stock price is affected by its tax liability.

Masulis and Trueman (1988) examine the implications of differential personal taxation for corporate investment and dividend decisions. They conclude that shareholders prefer deferred dividends to dividend income because of the tax advantage associated with capital gains. They note, however, that unlimited deferral of dividend could be costly to a firm. Firms that have excess retained earnings are very likely to invest in projects with decreasing marginal rates of return. They argue that the tax advantage and the cost disadvantage of capital gains cause shareholders in different tax brackets to disagree over optimal investment and dividend policies.

Talmor and Titman (1990) suggest that investor's preference for cash dividends or stock repurchases depends on the stability of personal tax rates. With constant personal tax rates, stock repurchases have tax advantages over dividends because of the possibility of tax deferment. With varying personal tax rates, it becomes difficult to make any general statements because there are some instances when dividends are preferred to capital gains. For example, if personal tax rates are expected to increase in the future, shareholders would rather receive dividend income and pay current taxes than realize future capital gains that may be taxed higher.

Chaplinsky and Seyhun (1990) suggest that investors try to reduce their tax liability by avoiding dividend income that is taxed at a higher rate. Brennan and Thakor (1990) conclude that despite the preferential tax treatment given to capital gains, if the effective personal tax rate on dividends is low, shareholders with low ownership holdings would prefer dividends while those with high ownership holdings would prefer repurchases. Chen, Grundy and Stambaugh (1990) could not find any evidence of a tax penalty associated with cash dividends.

DeAngelo (1991) investigates why firms pay dividends at all, if there are tax advantages associated with deferred income. He argues that there is a strong relationship between tax deferral and consumption deferral because the two are jointly supplied. If all firms in the economy decide to enjoy the tax deferral advantage associated with capital gains, consumption deferral will occur. This consumption deferral in turn creates a great demand for firms that pay dividends because investors want to spread their consumption over time.

IV. Lintner's Partial Adjustment Model

Lintner (1956) examines the variables that affect dividend policies of firms. His major conclusions are:

1. Earnings are the most important variable in a firm's dividend decision.
2. Managers are very reluctant to make dividend policy changes that have to be reversed within a short period.

3. Managers are more concerned with the rate of change in the existing dividend payout ratio than with establishing a new dividend payout ratio.

Lintner derived a dividend adjustment model for explaining the dividend behavior of U.S. firms between 1918 and 1941. Lintner's model was able to explain 85% of the changes in dividends in his sample.

Fama and Babiak (1968), Partington (1984), and Edelman, Baker and Farrelly (1985), provide evidence in support of Lintner's model. Nakamura and Nakamura (1985) and Nakamura (1989) use Lintner's model on a sample of Japanese firms. Nakamura and Nakamura (1985) conclude that including a lagged earnings variable in the equation improves the explanatory power of the model. This result is consistent with Fama and Babiak (1968). Nakamura (1989) also concludes that estimating Lintner's model by using a sample of firms with both dividend increases and decreases may lead to a specification error. He estimates the model differently for firms that increased dividends and for those that decreased dividends.

V. Summary of Existing Research

A review of the existing literature indicates that previous research concentrated on U.S. firms with little attention given to the dividend policy of firms in other countries. There are also contradictory hypotheses on the effect of dividend policy on the value of a firm. The irrelevancy theory says that there

is no relationship between the value of a firm and dividend policy. The information effects hypothesis suggests that dividends have a positive impact on the value of a firm, while the tax effects hypothesis implies that dividends have a negative effect on the value of a firm. Previous empirical studies provide evidence in support of each hypothesis. These contradictory empirical results call for more research in the relationship between dividend policy and the value of a firm.

This study examines the relationship between dividends and the value of a firm before and after a tax law change in countries that had a significant tax law change. The previous studies have been criticized on the grounds that information effects may have introduced some bias in the results. This problem is minimized in this study because any such biases should apply equally to the pre and post tax law periods. Any change in the relationship between the dividend policy and the value of a firm after a tax law change can therefore be partly attributed to tax effects. This study also employs a variation of the Capital Asset Pricing Model that avoids the shortcoming of a beta-based model. Market value of equity and ratio of book-to-market value of equity are used as alternative risk variables.

Lintner's model has been tested with U.S. data and recently with Japanese data. The application of this model to data in other countries adds to the literature of dividend policies.

CHAPTER 3

TAX ENVIRONMENT IN THE FIVE COUNTRIES AND STUDY DESIGN

I. Tax Environment

The main tax systems used in different countries are the classical and integrated tax systems. The classical tax system makes no distinction between retained and distributed profits. Corporate profits are taxed twice; once at the corporate level and again at the personal level. This is known as the "economic double taxation" of dividends. The integrated tax system is a system where the incidence of economic double taxation is partly reduced or eliminated. A system that partially reduces the double taxation is called a partial integration system and one that eliminates the double taxation completely is called a full integration or full imputation system.

Full integration can be achieved at the corporate or shareholders' level. At the corporate level, companies are exempt from paying taxes on distributed income but dividends received by investors are taxed. At the shareholders' level, full integration is achieved by allowing shareholders to claim full credit for taxes paid by the corporation.

Partial integration can be achieved at the corporate or shareholders' level

also. The two systems used to reduce double taxation at the corporate level are the split-rate system and the partial dividend reduction system. In the split-rate system, retained and distributed profits are taxed differently. Usually, the distributed profits are taxed at a lower rate to compensate for the extra taxes that are paid on dividends. The partial dividend deduction system allows companies to deduct some percentage of gross dividends paid in calculating taxable profits. For example, firms may be allowed to deduct 20% of the amount of cash dividends paid. This allows firms to reduce taxes on distributed profits.

Two ways to reduce the double taxation at the shareholders' level are the partial imputation system and the partial shareholder relief system. In the partial imputation system, retained and distributed profits are taxed at the same rate but shareholders receive partial credit for corporate taxes paid on distributed profit. The partial shareholder relief system allows domestic shareholders partial credit for corporate taxes paid. The tax system in each country and the tax law changes are discussed in the next section.

II. Australian Tax System and Tax Law Changes

Australia had the classical tax system in the early 80's. The maximum corporate tax was 46% and the maximum personal tax rate was 60%. The personal tax rates were considered high by Australian citizens. These high rates coupled with poor economic conditions led to tax avoidance and evasion.

These events led to the call for tax law changes. The tax reform movement started in 1984 and the content of the tax amendment was announced in September 1985. A major objective of the tax reform was to reduce individual marginal tax rates. The highest personal marginal tax rate was reduced from 60% to 55% in 1986 and later to 48.3% in 1987¹. The new tax law also introduced a full imputation system in 1987. This system eliminated the double taxation of dividends because shareholders are credited with the full taxes paid by firms. The imputation system necessitated the re-classification of dividends. Dividends paid from profits already taxed at the corporate level are classified as "franked" dividends. These are exempted from any taxes at the shareholder's level. "Unfranked" dividends are paid from company profits that haven't been taxed, and therefore are subject to taxes at the shareholder's level. The Australian imputation system does not provide cash refunds on imputation credits. The corporate tax rate was temporarily increased from 46% to 49% to partly finance the cost of changing from a classical to an imputation system. This rate was later reduced to 39% in 1988. Dividend payments and capital gains are taxed at the personal tax rate in Australia.

III. French Tax System and Tax Law Changes

France currently has a partial imputation system in which corporate taxes are partially refunded to shareholders as tax credits. The partial credit rate is

¹The current highest personal tax rate is 49%.

50%. This is called the "avoir fiscal". If the "avoir fiscal" exceeds the income tax liability, the excess is refunded to shareholders. Dividends are taxed as ordinary income while capital gains are taxed at a special rate.

France reduced its corporate tax rate from 50% to 45% in 1986 and further to 42% in 1987. The highest individual tax rate was also reduced from 65% to 58% in 1986 and later to 56.8% in 1987. In 1989, France had a major tax reform when it introduced the split-rate tax system. Under this system, the corporate tax rate on distributed profit was maintained at 42% but the rate on retained profits was reduced to 34%. The capital gains tax rate was also increased from 15% to 18.1%. The capital gains tax rate is a flat rate that applies if a shareholder holds more than 25% of the shares in a company or if proceeds from a sale of shares exceed a certain limit per year. This limit is FF251,500 (equivalent to \$41,508 in 1988) before the tax law change and FF307,600 (equivalent to \$53,246 in 1989) after the tax law change in 1989.

IV. German Tax System and Tax Law Changes

The German tax system is one of the most stable in the industrialized world. Germany introduced the full imputation and split-rate systems in 1976. The full imputation system allows shareholders to claim full credit for taxes paid at the corporate level. If the tax credit exceeds the income tax, shareholders can file for a refund. The tax rate on retained profit was 56% but this was reduced to 50% in 1990. The rate on distributed profit remained unchanged at

36%. The 1990 tax law change also reduced the highest personal tax rate from 56% to 53%. Dividend income in Germany is taxed as ordinary income while capital gains are tax exempt except for gains from sale of land owned for less than two years and these are taxed at the normal income tax rate.

V. Japanese Tax System and Tax Law Changes

Japan had a split-rate system before they changed to a partial shareholder relief system in 1990. In the Japanese split-rate system, the corporate tax rate on distributed profit was 32%, while the rate on retained earnings was 42%. The highest personal tax rate was 57%. The partial shareholder relief system allows domestic shareholders to deduct 5% of their dividend income from their personal tax liability at the federal level. The corporate tax rate was reduced to 37.5% after the 1990 tax law change and the highest personal tax rate was reduced to 35%. The tax law change introduced a 20% flat capital gains rate.

VI. United States Tax System and Tax Law Changes

United States has the classical tax system. Companies pay taxes on earnings and shareholders pay personal taxes on dividend income. The 1986 Tax Reform Act was a major tax law change in the U.S. and became effective in January 1987. The major objectives of the Reform Act were the reduction of rates and the elimination of the tax advantage accorded capital gains. The

corporate rate was reduced from 46% to 34%² and the top individual rate was reduced from 50% to 31%³. Before the tax law change, the highest capital gains rate was 20% while the highest tax rate on dividend income was 50%. The tax law change eliminated the preferential treatment given to capital gains. Both capital gains and dividend income are now taxed as ordinary income. The summaries of the tax systems and the tax rates in the five countries are provided in Tables 1 and 2.

²Starting from 1987, an additional 5% is levied on income between \$100,000 and \$335,000.

³The highest personal tax rate immediately after the tax law change in 1987 was 38.5% and this was later reduced to 31% in 1988. The 31% top tax bracket includes an additional 5% levied on income over \$49,300 for single people and \$82,150 for married couples.

Table 1: Tax Systems in Effect in the Countries Under Study (1983-1991)

Country	Before the Tax Law Change	After the Tax Law Change	Date of Change
Australia	Classical system	Full imputation system	1987
France	One corporate rate and partial imputation system	Split-rate and partial imputation system	1989
Germany	Split-rate and full imputation system	Split-rate and full imputation system with rate reductions	1990
Japan	Split-rate system	Partial shareholder relief system	1990
U.S.	Classical tax system	Classical tax system with 1986 Reform Act	1987

Source: Taxing Profits in a Global Economy Domestic and International Issues. OECD Publication, 1991.

Table 2: Summary of the Tax Rates in the Five Countries (1983-1991)

Panel A: Highest Corporate Tax Rates in the Five Countries			
Country	Before the Tax Law Change	Effective Date of Change	After the Tax Law Change
Australia	46.0%	1987	49.0%*
France	50.0%	1989	42(D) 34(R)%
Germany	36(D) 56(R)%	1990	36(D) 50(R)%
Japan	32(D) 42(R)%	1990	37.5%
U.S.	46.0%	1987	34.0%

D is distributed profit
R is retained profit

Panel B: Highest Marginal Personal Tax Rates on Dividend Income in the Five Countries

Country	Before the Tax Law Change	Effective Date of Change	After the Tax Law Change
Australia	60.0%	1987	48.3%*
France	57.9%	1989	57.9%
Germany	56.0%	1990	53.0%
Japan	57.0%	1990	35.0%
U.S.	50.0%	1987	31.0%

Panel C: Maximum Capital Gains Tax Rates in the Five Countries

Country	Before the Tax Law Change	Effective Date of Change	After the Tax Law Change
Australia	60.0%	1987	48.3%
France	15.0%	1989	18.1%
Germany	-	1990	-
Japan	-	1990	20.0%
U.S.	20.0%	1987	31.0%

*The 1991 highest corporate and marginal personal tax rates are 39% and 49% respectively.

VII. Calculation of Effective Tax Rates

As stated earlier, the five countries changed their tax laws within the period of study. The total effective rates on dividend income and capital gains are calculated before and after a major tax law change in each country. The tax law changes in Australia, France and Japan are considered major because these countries changed their tax systems. Though Germany only had a reduction of rates, this is also considered major because the German tax system has been very stable over the years. The 1986 Tax Reform Act in U.S. is a major tax law change because it eliminated the tax advantage accorded to capital gains over dividend income.

It is not possible to determine if there is a tax preference for dividend income or capital gains in each country by simply looking at the corporate and personal tax rates since different countries have different tax features (see Tables 1 and 2). The tax rates in conjunction with the different tax systems are used to calculate the total effective tax rates under three scenarios:

Scenario 1: All corporate earnings are paid as dividends.

Scenario 2: No dividends are paid but capital gains are realized.

Scenario 3: No dividends are paid and capital gains are not realized.

The major assumptions initially used in calculating the total effective rates are as follows:

1. Tax payers are in the top marginal tax bracket⁴.
2. Tax payers are in the top capital gains tax bracket⁴.
3. Tax payers face federal government tax only.

The formulas used in obtaining the effective tax rates for each country are given in Table 3.

⁴These assumptions are later relaxed.

Table 3: Formulas Used for the Calculation of Effective Tax Rates

Scenario	1	2	3
Australia			
Before	$T + (1-T)M$	$T + (1-T)g$	T
After	$T + [(1-T) + T]M - T = M^*$	T	T
France			
Before	$T + [(1-T) + c(1-T)]M - c(1-T)$	$T + (1-T)g$	T
After	$T + [(1-T) + c(1-T)]M - c(1-T)$	$T^R + (1-T^R)g$	T^R
Germany			
Before	$T + [(1-T) + T]M - T$	T^R	T^R
After	$T + [(1-T) + T]M - T$	T^R	T^R
Japan			
Before	$T + (1-T)M - c(1-T)$	T^R	T^R
After	$T + (1-T)M - c(1-T)$	$T + (1-T)g$	T
U.S.			
Before	$T + (1-T)M$	$T + (1-T)g$	T
After	$T + (1-T)M$	$T + (1-T)g$	T

where T is the corporate tax rate,

T^R is the corporate tax rate on retained profits for countries using the split-rate system,

M is the personal tax rate on dividends,

g is the capital gains tax rate and

c is the partial credit rate.

Scenario 1: All corporate earnings are paid as dividends.

Scenario 2: No dividends are paid but capital gains are realized.

Scenario 3: No dividends are paid and capital gains are not realized.

* Total tax liability in Australia is M (if $M > T$) and T (if $M < T$), but the highest marginal tax rate is 48.3% which is less than T . This means that effectively the total tax liability is T .

The effective tax rates are calculated for the pre and post tax law periods. A summary of the effective tax rates is given in Table 4 and the details of the calculations are given in Appendix A. These rates show that before the tax law changes, investors in the highest tax bracket in France, Japan and U.S. were clearly better off with realized and unrealized capital gains than with dividend income. In Australia, the unrealized capital gains option maximized shareholders' wealth. However, the effective rates on dividend income and realized capital gains options were the same which suggests that investors should be indifferent to the dividend income and realized capital gains options. In Germany, the investors were indifferent to all three options.

After the tax law changes, investors in the highest tax bracket in France and Japan were still better off with realized and unrealized capital gains than with dividend income. Investors in Germany were slightly better off with capital gains (realized and unrealized) while investors in Australia were indifferent to the three options. In U.S., the investors were indifferent to dividend income and realized capital gains but the unrealized capital gains option still maximized shareholders' wealth.

The results of these calculations suggest that shareholders' wealth may be affected positively or adversely depending on the nature of the tax law change. If the tax effects hypothesis is correct, then there should be a positive relationship between dividend yield and the value of a firm in countries that have higher effective rates on dividends. This relationship is therefore examined

before and after the tax law changes to see if there are any changes due to the tax law changes.

Table 4: Summary of Effective Tax Rates for Investors in the Highest Tax Bracket

Panel A: Effective Tax Rates Before the Tax Law Change			
Country	Dividends Paid	Cap. Gains Realized	Cap. Gains Unrealized
Australia	78.40%	78.40%	46.00%
France	68.43%	57.50% ⁵	50.00%
Germany	56.00%	56.00%	56.00%
Japan	67.36%	42.00%	42.00%
U.S.	73.00%	56.80%	46.00%

Panel B: Effective Tax Rates After the Tax Law Change			
Country	Dividends Paid	Cap. Gains Realized	Cap. Gains Unrealized
Australia	49.00%	49.00%	49.00%
France	63.37%	45.95% ⁵	34.00%
Germany	53.00%	50.00%	50.00%
Japan	56.25%	50.00%	37.50%
U.S.	54.46%	54.46%	34.00%

⁵It is assumed that investors pay the capital gains tax.

The preceding calculations were based on the assumption that investors were in the highest personal and capital gains tax bracket. This assumption was relaxed and the effective tax rates for investors in other personal tax brackets were calculated. These rates are shown in Table 5.

The shareholders' wealth in all tax brackets in Australia, Japan and U.S. were maximized with the unrealized capital gains option before the tax law change. After the tax law change, Japanese and U.S. shareholders in all tax brackets were still better off with unrealized capital gains while shareholders in all tax brackets in Australia were indifferent to all options.

In France, shareholders in three tax brackets were better off with dividend income than with unrealized capital gains before the tax law change. After the tax law change, shareholders in only two tax brackets were still better off with dividend income. This means that shareholders in one tax bracket who used to be better off with dividend income became better off with unrealized capital gains after the tax law change.

Shareholders in five of the six tax brackets were better off with dividend income than with unrealized capital gains in Germany before the tax law change. After the tax law change, investors in only three of the five tax brackets were still better off with dividend income. This suggests that the tax law change provided incentives for investors in two tax brackets to opt for capital gains rather than dividend income.

**Table 5: Effective Tax Rates for Other Tax Brackets
Before the Tax Law Change**

Australia			
Personal Tax Rate	Dividend Income	Realized Cap. Gains	Unrealized Cap. Gains
20.0%	56.80%	56.80%*	46.0%
38.0%	66.52%	65.52%	46.0%
46.0%	70.84%	70.84%	46.0%
48.3%	72.08%	72.08%	46.0%
60.0%	78.40%	78.40%	46.0%
France			
5.0%	28.75%	57.50%**	50.0%
24.0%	43.00%	57.50%	50.0%
29.0%	46.75%	57.50%	50.0%
49.0%	61.75%	57.50%	50.0%
57.9%	68.43%	57.50%	50.0%
Germany			
19.2%	19.2%	56.0%	56.0%
29.6%	29.6%	56.0%	56.0%
36.9%	36.9%	56.0%	56.0%
51.5%	51.5%	56.0%	56.0%
53.0%	53.0%	56.0%	56.0%
56.0%	56.0%	56.0%	56.0%

*In Australia, capital gains are taxed at the same rate as dividend income, therefore $m = g$.

**The 15% capital gains tax rate in France is a flat rate that applies if proceeds from the sale of shares exceed FF251,500 (equivalent to \$41,508 in 1988) per year or if the shareholder holds more than 25% of the shares in a company.

⁶See footnote 5.

Table 5 Continued

Japan.			
Personal Tax Rate	Dividend Income	Realized Cap. Gains	Unrealized Cap. Gains
20.0%	42.20%	42.0%	42.0%
30.5%	49.24%	42.0%	42.0%
35.0%	52.40%	42.0%	42.0%
57.0%	67.36%	42.0%	42.0%
U.S.			
15.0%	54.10%	54.10%	46.0%
28.0%	61.12%	56.80% ^{***}	46.0%
31.0%	62.74%	56.80%	46.0%
50.0%	73.00%	56.80%	46.0%

^{***}The highest capital gains tax rate in U.S. was 20%.

Table 5 Continued

**Panel B: Effective Tax Rates for Other Tax Brackets
After the Tax Law Change**

AUSTRALIA			
Personal Tax Rate	Dividend Income	Realized Cap. Gains	Unrealized Cap. Gains
20.0%	49.0%	49.0%	49.0%
38.0%	49.0%	49.0%	49.0%
46.0%	49.0%	49.0%	49.0%
48.3%	49.0%	49.0%	49.0%
France			
5.0%	17.35%	45.95% ⁷	34.0%
24.0%	33.88%	45.95%	34.0%
29.0%	38.23%	45.95%	34.0%
49.0%	55.63%	45.95%	34.0%
57.9%	63.37%	45.95%	34.0%
Germany			
19.2%	19.2%	50.0%	50.0%
29.6%	29.6%	50.0%	50.0%
36.9%	36.9%	50.0%	50.0%
51.5%	51.5%	50.0%	50.0%
53.0%	53.0%	50.0%	50.0%

*The 18.1% capital gains tax rate in France is a flat rate that applies if proceeds from the sale of shares exceed FF307,600 (equivalent to \$53,246 in 1989) per year or if the shareholder holds more than 25% of the shares in a company.

⁷See footnote 5.

Table 5 Continued

Japan.			
Personal Tax Rate	Dividend Income	Realized Cap. Gains	Unrealized Cap. Gains
20.0%	46.88%	50.0%**	37.5%
30.5%	53.44%	50.0%	37.5%
35.0%	56.25%	50.0%	37.5%
U.S.			
15.0%	43.90%	43.90%***	34.0%
28.0%	52.48%	52.48%	34.0%
31.0%	54.46%	54.46%	34.0%

**The 20% capital gains tax rate in Japan is a flat rate.

***In the U.S., capital gains are taxed at the same rate as dividend income, therefore $m = g$.

VIII. Study Design

The main source of data for this study is the Disclosure-World Scope data base. This data base provides annual financial information on public firms all over the world. The use of one data source for all countries minimizes data inconsistencies and different standards that are often encountered with different data sources. Information on corporate and personal tax rates and the tax systems in each country are obtained from Price Waterhouse Tax Handbook, International Tax Summaries, and Organization for Economic-Cooperation and Development (OECD) publications. These sources provide details of different tax issues in many countries. The risk free rates are obtained from International Financial Statistics.

The criteria used for firm selection are as follows:

1. All firms must be industrial companies
2. The firms must have complete data for all the relevant variables for the period of study and
3. The fiscal year dates for all the companies must not be more than three months apart.

The use of only industrial firms is an effort to keep the data more homogeneous because U.S. dividend studies have shown that dividend payout ratios for utilities are very high compared to those of other industries. Harkins and Walsh Jr. (1971) report that the average payout ratios for utility companies range from 47% to 82%. Michel (1979) also finds that dividend payout ratios for

electric firms range from 65% to 73%. The selection of firms with complete data for the relevant variables for the entire period means that only "successful" firms are used. This criterion introduces a selection bias but this is necessary to ensure continuity. Most of the firms used have the same end of year fiscal dates with only a few that are three months or less apart.

The period of study is between 1983 and 1991, a nine year period. This period is chosen because complete financial data for international dividends is not readily available for longer periods. The distribution of firms that meet all the criteria is given below.

<u>COUNTRY</u>	<u>NO. OF FIRMS</u>
Australia	37
France	107
Germany	80
Japan	252
U.S.	372

Disclosure-Worldscope data is stored in CD-ROM. The data for all firms listed in each country are first down-loaded to a floppy disk. The data are later transferred to a Quattro Pro program where all the firms are sorted according to industry group and screened. The data analysis is done with SAS programs.

CHAPTER 4

COUNTRY COMPARATIVE DIVIDEND STUDIES

I. Introduction

Two studies that compare dividend policies of different countries are Khoury and Smith (1977) and Michel and Shaked (1986). Khoury and Smith compare the dividend payout ratios and dividend yields for Canadian and U.S. firms. They conclude that U.S. dividend payout ratios and dividend yields are significantly higher than those of the Canadians. Michel and Shaked find that dividend yields for U.S. firms are significantly higher than dividend yields of Japanese firms, while dividend payout ratios of Japanese firms are higher than those of U.S. firms. These results suggest that there are differences in dividend payout ratios across countries. In this study, dividend payout ratios, dividend yields and dividend growth rates in Australia, France, Germany, Japan and U.S. are compared for any significant differences.

II. Methodology

The nine-year means and the yearly means of dividend payout ratios, dividend yields and dividend growth rates are calculated for each country.

These means are compared by conducting a Tukey "means difference" test. This test is used because it is more suitable for multiple comparisons. The Tukey-Kramer method considers two means to be significantly different if

$$\frac{|y_i - y_j|}{s[(1/n_i + 1/n_j)/2]^{1/2}} > q(\alpha; k, v) \dots\dots\dots 3$$

where y_i and y_j are means of group i and j respectively,

s is the mean square error for the one way Anova model,

n_i is the number of observations in group i and

$q(\alpha; k, v)$ is the α -level critical value of standardized range distribution of k independent normal variables with v degrees of freedom.

A 5% significance level is used to see if there are any significant differences between the countries.

III. Results

The results of the inter-country comparison show that there are significant differences across countries. Table 6 shows the means and standard deviations of dividend payout ratios, dividend yields and dividend growth rates for the nine-year period.

Table 6: Summary Statistics for Dividend Payout Ratios, Dividend Yields and Dividend Growth Rates for the Period 1983 - 1991

Country	Dividend Payout Ratios			Dividend Yield			Dividend Growth		
	Mean	Std.Dev.		Mean	Std.Dev.		Mean	Std.Dev.	
Australia	0.5273	0.1755	A	0.0477	0.0169	A	0.1306	0.1116	A
France	0.2563	0.1577	C	0.0214	0.0119	B	0.1089	0.1146	A B
Germany	0.5112	0.2056	A	0.0231	0.0098	B	0.0721	0.1065	C B
Japan	0.3348	0.1544	B	0.0099	0.0037	C	0.0518	0.0585	C
U.S.	0.3148	0.2102	B	0.0229	0.0160	B	0.0572	0.1077	C

Means that have the same letter are not significantly different

For the entire period, Australia has the highest average dividend payout ratio of 52.73%, followed by Germany, Japan and U.S. with average dividend payout ratios of 51.12%, 33.48% and 31.48% respectively. France has the lowest dividend payout of 25.63%. The Tukey "means difference" test indicates that dividend payout means for Australian and German firms are not significantly different. However, these two means are significantly different from the payout means of France, Japan and U.S. The dividend payout ratios of Japan and U.S are not significantly different from each other but are significantly higher than that of France.

The dividend yield means for Australia, Germany, U.S., France, and Japan are 4.77%, 2.31%, 2.29%, 2.14% and 0.99% respectively. The dividend yields for the Australian firms are significantly higher those of the other countries. The dividend yields for the German, U.S. and French firms are not significantly different from each other. The dividend yields for the Japanese firms are significantly lower than those of the other four countries.

Australia also has the highest dividend growth rate of 13.06%. France is next with a growth rate of 10.89%, followed by Germany with 7.21%. United States dividend growth rate is 5.72% and Japan has the lowest growth rate of 5.18%. The Australian and French dividend growth rates are not significantly different, but are significantly different from those of the other countries. The average dividend growth rates for Germany, Japan and U.S. are not significantly different.

For the entire period, the results show that the Japanese market exhibits the lowest degree of variability in the three statistics. The U.S. market exhibits the highest variability in dividend payouts. The Australian market exhibits the highest variability in dividend yield, while the French market exhibits the highest variability in dividend growth rate.

The yearly means and standard deviations of the three variables are shown in Table 7. An examination of the yearly means of dividend payout ratios and dividend yields in each country shows that they are fairly stable while the growth rates tend to be more volatile.

Table 7: Summary Statistics for the Five Countries**Panel A: The Yearly Means of Dividend Payout Ratios (1983-1991)**

Year	Stats.	Australia	France	Germany	Japan	U.S.
1983	Mean	0.4844	0.3037	0.5281	0.3491	0.3111
	Std.Dev.	0.3080	0.2729	0.3375	0.2610	0.2636
1984	Mean	0.4979	0.2616	0.5225	0.3404	0.3083
	Std.Dev.	0.2724	0.2647	0.3050	0.2456	0.2693
1985	Mean	0.4820	0.2622	0.5323	0.3433	0.3127
	Std.Dev.	0.2317	0.2582	0.3021	0.2492	0.2803
1986	Mean	0.4780	0.2775	0.5212	0.3584	0.3211
	Std.Dev.	0.2627	0.2622	0.3031	0.2479	0.2983
1987	Mean	0.5713	0.2573	0.5270	0.3434	0.3030
	Std.Dev.	0.2440	0.2227	0.3000	0.2567	0.2714
1988	Mean	0.5315	0.2616	0.5136	0.3382	0.2948
	Std.Dev.	0.2545	0.2232	0.2741	0.2207	0.2670
1989	Mean	0.5571	0.2070	0.4544	0.3031	0.3013
	Std.Dev.	0.2410	0.1587	0.2807	0.1834	0.2758
1990	Mean	0.6381	0.2401	0.4930	0.3224	0.3351
	Std.Dev.	0.2300	0.1876	0.2708	0.2223	0.3037
1991	Mean	0.5051	0.2361	0.5085	0.3153	0.3458
	Std.Dev.	0.3613	0.1805	0.2827	0.2157	0.3469

Table 7 Continued**Panel B: The Yearly Means of Dividend Yields (1983-1991)**

Year	Stats.	Australia	France	Germany	Japan	U.S.
1983	Mean	0.0531	0.0250	0.0243	0.0148	0.0245
	Std.Dev.	0.0285	0.0225	0.0145	0.0800	0.0186
1984	Mean	0.0463	0.0204	0.0266	0.0128	0.0269
	Std.Dev.	0.0238	0.0174	0.0150	0.0078	0.0201
1985	Mean	0.0394	0.0234	0.0223	0.0125	0.0231
	Std.Dev.	0.0222	0.0116	0.0119	0.0074	0.0175
1986	Mean	0.0478	0.0222	0.0279	0.0103	0.0217
	Std.Dev.	0.0248	0.0173	0.0127	0.0059	0.0166
1987	Mean	0.0434	0.0184	0.0207	0.0133	0.0209
	Std.Dev.	0.0138	0.0132	0.0152	0.0044	0.0175
1988	Mean	0.0448	0.0213	0.0238	0.0060	0.0213
	Std.Dev.	0.0171	0.0138	0.0123	0.0030	0.0174
1989	Mean	0.0600	0.0167	0.0188	0.0054	0.0206
	Std.Dev.	0.0292	0.0109	0.0115	0.0022	0.0169
1990	Mean	0.0623	0.0232	0.0226	0.0061	0.0268
	Std.Dev.	0.0399	0.0166	0.0153	0.0025	0.0248
1991	Mean	0.0322	0.0220	0.0211	0.0072	0.0206
	Std.Dev.	0.0238	0.0185	0.0139	0.0030	0.0181

Table 7 Continued:**Panel C: The Yearly Means of Dividend Growth Rates (1983-1991)**

Year	Stats.	Australia	France	Germany	Japan	U.S.
1983	Mean	0.1359	0.0465	0.0999	0.0435	0.0532
	Std.Dev.	0.3451	0.3166	0.3486	0.2451	0.3173
1984	Mean	0.0649	0.0330	0.0985	0.0419	0.0915
	Std.Dev.	0.3234	0.2743	0.3505	0.2257	0.2607
1985	Mean	0.1606	0.1383	0.0943	0.0640	0.0598
	Std.Dev.	0.3366	0.3621	0.4427	0.1862	0.2377
1986	Mean	0.0930	0.1735	0.0344	0.0210	0.0231
	Std.Dev.	0.3204	0.4279	0.2919	0.2712	0.2785
1987	Mean	0.3300	0.1985	0.0278	-0.0196	0.0511
	Std.Dev.	0.3246	0.3018	0.2982	0.3162	0.2490
1988	Mean	0.1709	0.1905	0.0781	0.0511	0.0593
	Std.Dev.	0.4518	0.2884	0.3327	0.3061	0.2174
1989	Mean	0.3682	0.1602	0.0682	0.1538	0.0700
	Std.Dev.	0.4498	0.3672	0.2915	0.2793	0.2222
1990	Mean	0.0196	0.0758	0.0840	0.0711	0.0476
	Std.Dev.	0.4370	0.3027	0.3349	0.1512	0.2342
1991	Mean	-0.1677	-0.0395	0.0636	0.0392	0.0590
	Std.Dev.	0.4707	0.3915	0.4092	0.1779	0.2244

IV. Discussion

The differences in dividend payout ratios in the countries may be a reflection of different institutional structures, economic or tax factors. Germany and Japan are often reported as having ownership structures that are concentrated in the hands of a few establishments, mostly banks. If ownership structure affects the amount of dividends paid, one would expect that Germany and Japan should have similar dividend payout ratios. The results in this section are not consistent with this point of view. Germany has a high dividend payout ratio while Japan has a relatively low dividend payout ratio. France has the lowest dividend payout ratio followed by Japan. The Japanese low dividend payout ratio has been attributed to the emphasis on long term growth by firms. The low dividend yields observed for the Japanese and U.S. firms are consistent with Michel and Shaked (1986). The low growth rates observed in Japan and U.S may be a reflection of the fact that firms in these countries are slow in adjusting their dividend payments to changes in earnings.

Chapter 5

EFFECTS OF TAX LAW CHANGES ON DIVIDEND PAYOUT RATIOS

I. Introduction

Taxation is an important factor in most financing and investment decisions. Most recent tax law changes have reduced both corporate and personal tax rates. These reductions result in more cash flow to firms but do not necessarily translate to payment of more dividends. The pre and post tax law payout ratios in the five countries under study are examined to assess the impact of the tax law changes on dividend payout ratios.

II. Hypotheses

The effective tax rates of investors in all tax brackets and the relative changes in effective tax rates on dividend income and capital gains are used to formulate the theoretical effects of tax law changes on dividend payout ratios. These relative changes in effective tax rates are shown in Tables 8 and 9 and the effective tax rates for all tax brackets were given in Table 5 (Chapter 3).

Table 8: Summary of Changes in Effective Tax Rates for Individuals in the Highest Tax Brackets

Panel A: The Percentage Change in Effective Tax Rates for Dividend Payments

Country	Before the tax Law Change	After the Tax Law Change	Percentage Change
Australia	78.40%	49.00%	-37.50%
France	68.43%	63.37%	-7.39%
Germany	56.00%	53.00%	-5.36%
Japan	67.36%	56.25%	-16.50%
U.S.	73.00%	54.46%	-25.40%

Panel B: The Percentage Change in Effective Tax Rates for Unrealized Capital Gains

Country	Before the Tax Law Change	After the Tax Law Change	Percentage Change
Australia	46.00%	49.00%	6.12%
France	50.00%	34.00%	-32.00%
Germany	56.00%	50.00%	-10.71%
Japan	42.00%	37.50%	-10.71%
U.S.	46.00%	34.00%	-26.09%

Table 9: Summary of Changes in Effective Tax Rates for Individuals in All the Tax Brackets

Tax Bracket	Percentage in Dividend Income Rates	Percentage Change in Unrealized Capital Gains Rates
	Australia	
20.0%	-13.73%	6.52%
38.0%	-26.34%	6.52%
46.0%	-30.83%	6.52%
48.3%	-32.02%	6.52%
60.0%	-37.50%	6.52%
	France	
5%	-39.65%	-32.0%
24%	-21.21%	-32.0%
29%	-18.22%	-32.0%
49%	-9.91%	-32.0%
57.9%	-7.39%	-32.0%
	Germany	
19.2%	0%	-10.71%
29.6%	0%	-10.71%
36.9%	0%	-10.71%
51.5%	0%	-10.71%
53.0%	0%	-10.71%
56.0%	-5.36%	-10.71%

Table 9 Continued

Tax Bracket	Percentage in Dividend Income	Percentage Change in Unrealized Capital Gains Rates
	Japan	
20%	11.09%	-10.71%
30.5%	8.53%	-10.71%
35.0%	7.97%	-10.71%
57.0%	-16.0%	-10.71%
	U.S.	
28%	-18.85%	-26.09%
28%	-14.14%	-26.09%
31%	-13.20%	-26.09%
50%	-25.40%	-26.09%

A. Australia

In Australia, the calculation of effective tax rates for investors shown in Table 5 indicates that investors in all tax brackets were better off with unrealized capital gains before the tax law change. After the tax law change, all investors became indifferent to dividend income and unrealized capital gains. This means that the tax law change eliminated the tax advantage that the unrealized capital gains option had over the dividend income option. The tax law change therefore favored the dividend income option.

The decline in effective tax rates for dividend income and unrealized capital gains are calculated for all tax brackets and is shown in Table 9. The result shows that the decline in effective tax rates on dividend income is higher than that on unrealized capital gains for investors in all tax brackets. For example, the total effective tax rate on dividend income for individuals in the top tax bracket before the tax law change was 78.4%. This declined to 49% after the tax law change which represents a 37.5% decrease in the effective tax rate. The effective tax rate on unrealized capital gains for individuals in the top tax bracket increased from 46% to 49% after the tax law change, a 6.12% increase in rates. This is another indication that the tax law change favored the payment of more dividends⁸. The dividend payout ratio in Australia is therefore

⁸If taxes exclusively influence dividend policy the calculations show that no dividends should be paid in Australia, France, Japan and U.S. because it is optimal to always realize capital gains. However, we know that firms do pay dividends. Therefore the effects of these tax law changes on payout ratios are examined in light of whether the tax law changes favor the payment of more or less dividends.

expected to increase after the tax law change.

However, there were reports of tax evasion in Australia before the tax law change and this was one of the reasons the government embarked on the 1985 tax reform. Partington (1987) also reports that:

In Australia, approximately 70% of dividends have been received tax free in the hands of the initial recipients, and it is therefore possible that managers might perceive a tax induced preference for higher payouts rather than lower payouts.

This suggests that there were loopholes in the Australian tax system that enabled investors to shield their dividend income from taxation. This implies that the high effective tax rates on dividend income before the tax law change may not be meaningful. A correct hypothesis might therefore accommodate the assumption that investors did not pay taxes on dividend income and capital gains. A recalculation of the effective tax rates before the tax law change shows that investors were indifferent to dividend income or capital gains⁹. With this assumption, the expected increase in dividend payout ratios may not materialize. The pre and post tax law dividend payout ratios should not be significantly different. There have been no reports of tax evasions after the tax law change.

⁹If income taxes on dividends are not paid, the total effective tax rate on dividend income will be T , which is the tax paid at the corporate level.

B. France

In France, the effective tax rates show that investors in the 5%, 24% and 29% tax brackets preferred dividend income before the tax law change. After the tax law change, only investors in the 5% and 24% tax brackets were still better off with dividend income¹⁰. The tax law change therefore provided enough incentive for investors in the 29% bracket to change their preference from dividend income to unrealized capital gains. This implies that the tax law change favored capital gains.

A comparison of the changes in effective tax rates on dividend income and unrealized capital gains (Table 9) also shows that the decline in the effective tax rate on unrealized capital gains is higher than that on dividend income for investors in all tax brackets except for the lowest. For example, the effective tax rate on dividend income for individuals in the top tax bracket declined from 68.43% to 63.37% after the tax law change, a 7.39% decrease. The unrealized capital gains tax rate for individuals in the top tax bracket declined from 50% to 34%, a relative change of 32%. These relative changes in effective tax rates support the conclusion that the tax law change favored capital gains. The dividend payout ratios in France are therefore expected to decrease after the tax law change.

¹⁰We are assuming that number of investors in the various tax brackets are roughly the same before and after the tax law change.

C. Germany

In Germany, the effective tax rates show that investors in the five tax brackets were better off with dividend income before the tax law change. After the tax law change, investors in only three tax brackets were still better off with dividend income. Investors in the remaining two tax brackets preferred capital gains. This suggests that the tax law change in Germany favored capital gains.

In addition, the effective tax rates on unrealized capital gains declined for all investors but the rates on dividend income remained the same for most investors as shown in Table 9. It is only in the top tax bracket that the effective tax rate on dividend income declined by 5.36% for some investors compared to the 10.71% decline on unrealized capital gains option. This suggests that the tax law change favored capital gains and is consistent with the earlier conclusion. A decline in dividend payout ratios is therefore expected in Germany after the tax law change.

D. Japan

In Japan, the effective tax rates of investors show that investors in all tax brackets were better off with unrealized capital gains before and after the tax law change. It is not possible to predict the direction of change in dividend payout ratios from this information alone.

The calculation of the changes in effective tax rates shows that the effective tax rates on unrealized capital gains declined for all investors. On the

other hand, the effective tax rates on dividend income increased for investors in three tax brackets while it decreased for some investors in the top tax bracket. It appears therefore that the tax law change in Japan generally favored the capital gains option. Dividend payout ratios in Japan are therefore expected to decrease after the tax law change.

E. United States

Investors in all tax brackets in U.S. preferred unrealized capital gains to dividend income before and after the tax law change. As in the case of Japan, it is not possible to predict the direction of change in dividend payout ratios from this information alone.

The changes in effective tax rates for dividend income and unrealized capital gains show that the decline in effective tax rates for unrealized capital gains are slightly higher than that on dividend income for most investors except in the top tax bracket where the decline in both options are similar. This suggests that the tax law change in general favored the unrealized capital gains option. The dividend payout ratios in U.S. is therefore expected to decrease after the tax law change.

III. Methodology

The effect of tax law changes on dividend payout ratios is evaluated by comparing the pre and post law means. The paired t-test, the Sign test (S-test) and the Wilcoxon signed rank test (W-test) are used to test for any significant difference between the pre and post-tax law payout ratios.

The paired t-test compares the pre and post tax law means using the assumption that the ratios are normally distributed. The W-test and the S-test are nonparametric alternatives to the t-test which are less sensitive to the normality assumption. In particular, these tests can be more powerful than the t-test if outliers are present in the data. Such outliers seem to be present in the Australian and French data. The paired t-test tests the null hypothesis that the difference between the "pre" and "post" test means is significantly different from zero. The S-test tests the hypothesis that the frequencies of dividend increases and decreases before and after the tax law change in each country are similar. The W-test tests the hypothesis that the distributions of the pre and post tax law payout ratios are identical. If the normality assumption is reasonably valid, results of the three tests should not be dramatically different. A one-tailed test is used for all the countries because the dividend payout ratios are predicted to move in a certain direction after the tax law change.

IV. Results

Tests of the difference between the pre and post tax law dividend payout ratios along with their p-values are reported in Table 9. The p-values show the significance level of the test. The pre and post law dividend payout ratios in Australia are 48.56% and 56.06% respectively. The paired t-test indicates that this increase in payout ratio is marginally significant at the 11% level. The W-test and S-test show that there is no significant difference between the pre and post law payout ratios.

The pre-law dividend payout ratio for France is 27.06% and the post-law ratio is 22.77%. The paired t-test indicates that there is a significant decline in dividend payout ratios after the tax law change. The S-test and the W-test show that there is no significant difference between these two means.

The pre-law mean for Germany is 51.42% and the post-law mean is 50.08% while the pre and post law means for U.S. are 31.33% and 31.60% respectively. Each of the three tests indicate there are no significant differences in payout ratios after the tax law changes in these two countries. .

The Japanese pre and post law payout ratios are 33.94% and 31.89% respectively. All three tests show that the two means are significantly different.

Table 10: The Pre and Post Tax Law Means of Dividend Payout Ratios

Country	Pre-Tax Law Change Means	Post-Tax Law Change Means	Paired* T-Test	S-Test*	W-Test*
Australia	0.4856	0.5606	0.11	0.74	0.28
France	0.2706	0.2277	0.03**	0.35	0.25
Germany	0.5142	0.5008	0.63	0.73	0.68
Japan	0.3394	0.3189	0.04**	0.00**	0.00**
U.S.	0.3133	0.3160	0.39	0.14	0.15

*The numbers reported are the p-values.

**Denotes significance at the 5% level.

V. Interpretation of the Results

Two predictions are made on the effect of the Australian tax law change on dividend payout ratios. One prediction is that dividend payout ratio should increase after the tax law change. The other is that both means should not be significantly different. The later prediction is based on the fact that there was widespread evasion of taxes before the tax law change.

The result of the paired t-test shows that the increase in the dividend payout ratios is marginally significant at the 11% level. However, the results of the W-test and the S-test show that there is no significant difference between the two means. An examination of the data shows that the marginal significance found by the paired t-test is driven by one outlier. If the data for that firm is removed, the three "mean difference" tests will find an insignificant difference between the pre and post law ratios. It may therefore be more appropriate to conclude that there is no significant difference between the pre and post law payout ratios. The Australian firms maintained about the same average payout ratios before and after the tax law change. The high effective rate on dividend income before the tax law change was irrelevant because investors avoided the taxes on dividends.

In France, the result of the paired t-test suggests that the dividend payout ratios decreased after the tax law change. The tax law change appears to have led to the retention of more corporate earnings by French firms. This was expected because one of the reasons given by the French government for

introducing the split-rate system was to boost investment by encouraging retention of corporate earnings.

However, the S-test and the W-test show that there is no significant difference between the pre and post law payout ratios. This contradicts the result of the paired t-test. An examination of the distribution of the dividend payout ratios shows that there is a skewness in the data. The distribution is skewed to the left which implies that the decline in ratios is due to some firms who had deep cuts in dividend payouts after the tax law change. This makes it difficult to make any general statement about the effect of the tax law change on dividend payout ratios in France.

There is no significant difference between the pre-law and post-law payout ratios in Germany and U.S. This conclusion is supported by the three tests. It is predicted that the dividend payout ratios in Germany and U.S. should decline after the tax law change but these results suggest that the tax law change in both countries did not have any significant impact on dividend payout ratios. Firms and investors did not think that the relative changes in both options were significant enough to affect their preference for dividend income or capital gains. The U.S. result is consistent with Abruntyn and Turner (1990) and Bolster and Janjigian (1991) that find no significant difference between the pre and post law dividend ratios in U.S. but contradicts Gordon and Mackie-Mason (1990) that found a significant increase in dividend payout ratios in U.S. after the tax law change.

The results of the three "mean difference tests" indicate that there is a significant decline in dividend payout ratios in Japan after the tax law change. It can therefore be concluded that the tax law change significantly decreased the dividend payout ratios in Japan because it favored the payment of less dividends.

The trends in the dividend payout ratios in the five countries are shown in Figures 1 through 5 as a visual aid. There appears to be significant movement in payout ratios in the year of the change in Australia and France. There was a sharp increase in Australia and a sharp decline in France even though there was a fairly stable trend before the tax law change.

Figure 1: Yearly Dividend Payout Ratios In Australia

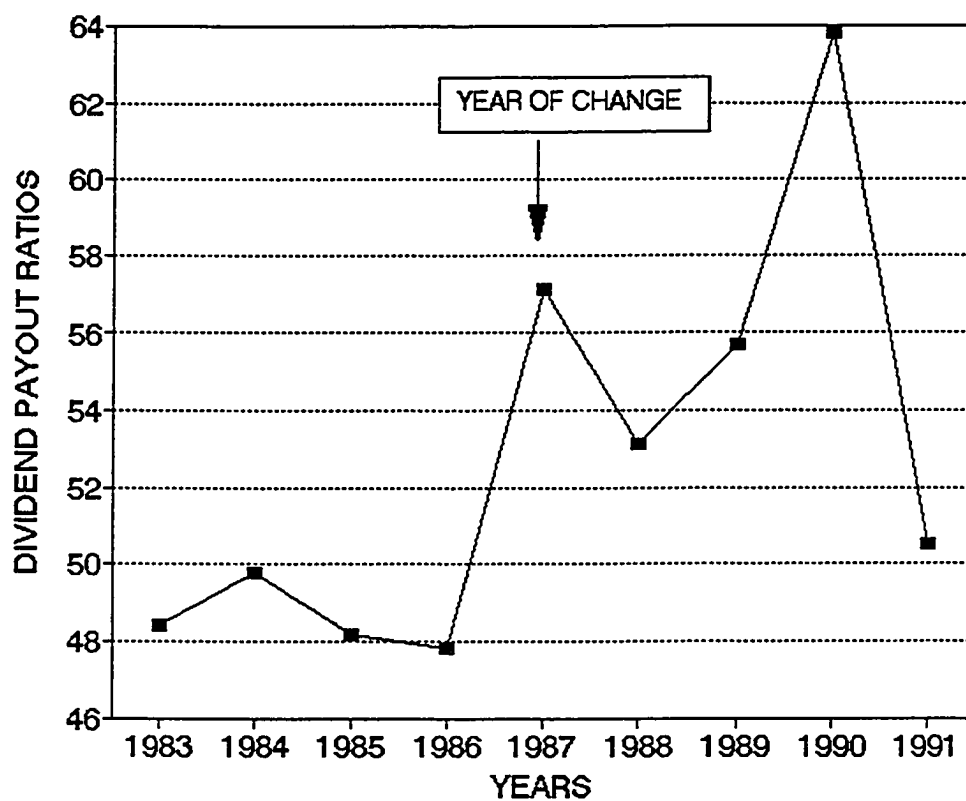


Figure 2: Yearly Dividend Payout Ratios in France

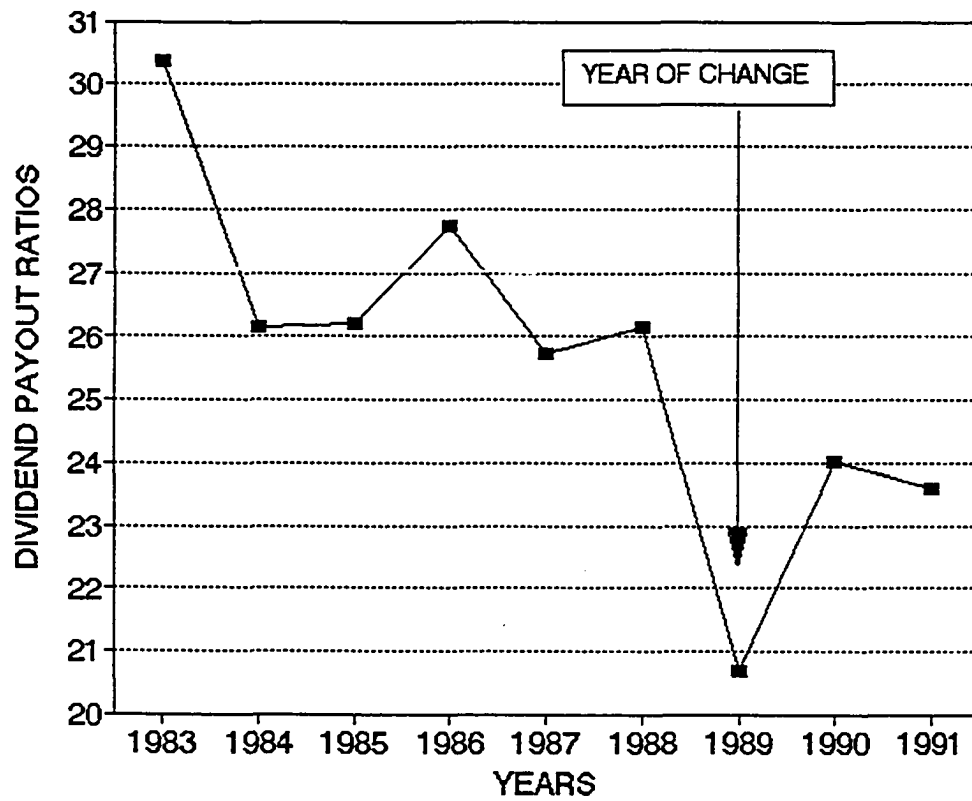


Figure 3: Yearly Dividend Payout Ratios In Germany

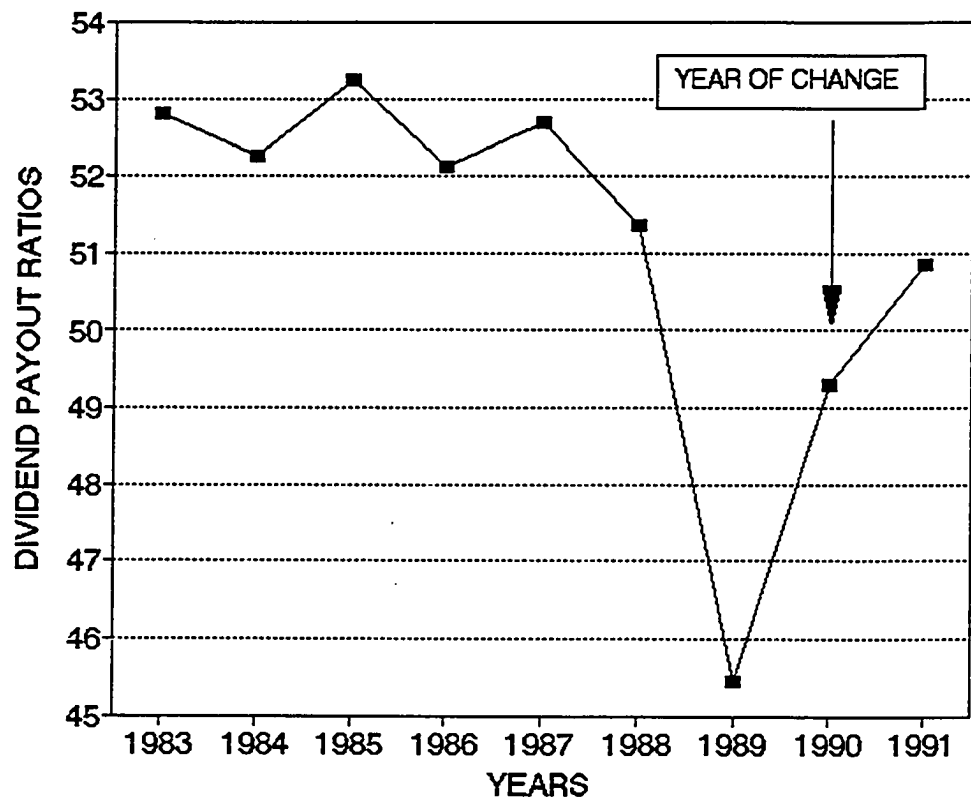


Figure 4: Yearly Dividend Payout Ratios in Japan



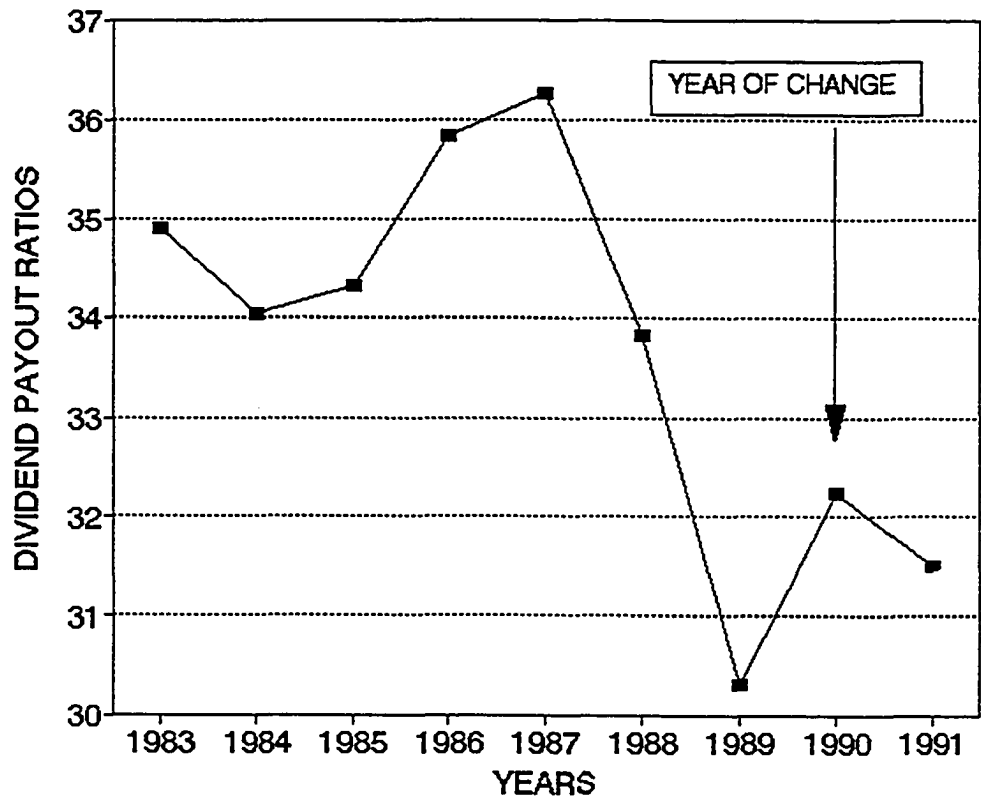
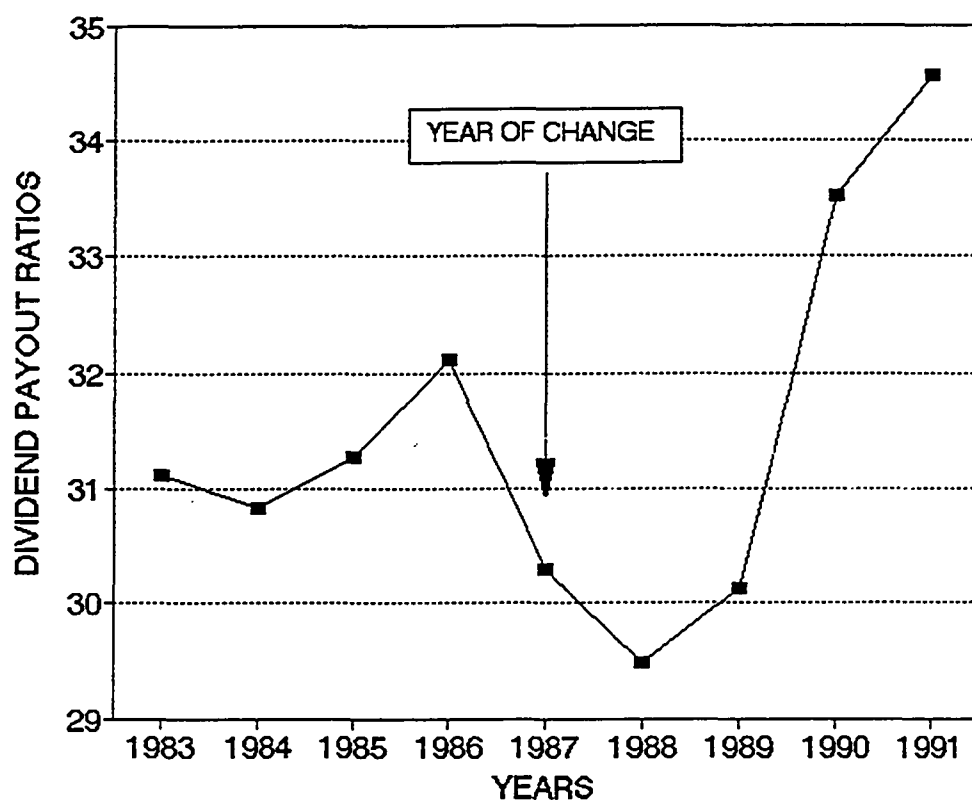


Figure 5: Yearly Dividend Payout Ratios in United States



VI. Adjustment of the Dividend Payout Ratios for Macro

Economic Variables

It is possible that dividend payout ratios are influenced by macro economic variables. There is no documentation of any study, to my knowledge, that has adjusted the dividend payout ratios for macro economic effects. I selected and examined variables that are likely to influence dividend payouts. These variables are interest rates, gross national product (GNP) and growth rate of GNP. If it is established that these variables affect dividend payout ratios, they can be used as covariates to obtain the adjusted means for the payout ratios. In order to do this, there has to be a consistent relationship between dividend payout ratios and the covariates. These relationships are examined by regressing dividend payout ratios on each of the proposed covariates. The regressions show that there is no significant relationship between dividend payout ratios and GNP or GNP growth in all the countries. There is a weak negative relationship between dividend payout ratios and interest rates (the higher the interest rates the lower the dividend payout ratios). A possible explanation of the observed negative relationship is that during periods of high interest rates, it becomes cheaper for firms to use internal financing. Firms therefore conserve their cash flow for further investment by retaining larger proportions of earnings. This results in low dividend payout ratios.

Therefore interest rates are used as a covariate to adjust for macro

economic effects using covariance analysis (the results of the adjusted means are given in Table 10). A t-test shows that the changes in dividend payout ratios for Germany and U.S. are insignificant while the changes in payout ratios for Australia and France and Japan are significant. The dividend payout ratio for Australia increased from 48.56% to 56.63%. There was a decrease in the dividend payout ratio in France from a pre-law mean of 27.08% to post-law of 22.75%. Germany's dividend payout ratio changed from a pre-law average of 50.59% to a post-law average of 52.96%, while Japan's ratio changed from a pre-law of 34.15% to a post-law of 32.14%. The pre and post tax law dividend payout ratios for U.S. are 31.64% and 31.35% respectively. The unadjusted means shown in Table 9 are very similar to the adjusted means. This implies that dividend payout ratios are not affected very much by interest rates in the five countries.

Table 11: The Adjusted Pre and Post Tax Law Means of Dividend Payout Ratios

Country	Pre-Tax Law Mean	Post-Tax Law Mean
Australia	0.4856	0.5663
France	0.2708	0.2275
Germany	0.5059	0.5296
Japan	0.3415	0.3214
U.S.	0.3164	0.3135

The dividend payout ratios in the years before the tax law changes are also examined for any lag effects. Talmor and Titman (1990) suggest that investors' preference for cash dividends or deferred income may be influenced by future changes in tax laws. Investors who would normally realize capital gains may decide to receive immediate dividend income rather than realize future capital gains that may be taxed at a higher rate due to an announced or anticipated tax law change and vice versa. It is therefore important that any possibility of such lag effects be examined. This is achieved by comparing the dividend payout ratios in the year that the announcement of a tax law change was made to the mean of the pre-announcement payout ratios. If there is a lag effect there should be a significant change in the year that the tax law change was announced. This means that most of the effect of the tax law change will take place in the announcement year rather than the year the tax law change actually took effect. The tax law change in Australia was announced in 1985 and became effective in 1987. The tax law change in France was announced in 1987. Germany and Japan's tax law changes were announced in 1988. The content of the Tax reform Act in U.S. was announced in 1986. No significant lag effects are found for any country.

Khoury and Smith (1977) claim that changes in tax laws can be captured by dividend growth rates. Tax law changes that reduced the tax disadvantage of dividend income should lead to increases in dividend growth rates while tax law changes that increased the tax disadvantage of dividend income should

lead to decreases in dividend growth rates. Dividend growth rates are therefore examined to see the direction of the growth rates. Khoury and Smith's claim suggests that the dividend growth rates in France, Germany, Japan and U.S should decrease after the tax law. The Australian dividend growth rates should increase if we assume that the dividend taxes are paid, otherwise the dividend growth rates should remain the same.

The results show that there are insignificant change in dividend growth rates for Australia, Germany, Japan and U.S. while there is a significant decrease in the dividend growth rate in France. The dividend growth rate in France declined by more than 50% in the year of the tax law change. The French result is consistent with the prediction. The Australian result is also consistent with the prediction that assumes investors did not pay taxes on their income before the tax law change. The pre and post tax law dividend growth rates are shown in Table 11.

Table 12: The Pre and post Tax Law Means of the Dividend Growth Rates

Country	Pre-Tax Law Change Mean	Post-Tax Law Change Mean	Paired* T-Test	S-Test	W-Test
Australia	0.1135	0.1441	0.19	0.31	0.35
France	0.1301	0.0655	0.09**	0.01**	0.00**
Germany	0.0716	0.0738	0.48	0.22	0.17
Japan	0.0508	0.0552	0.32	0.37	0.11
U.S.	0.0569	0.0574	0.48	0.21	0.16

*The numbers reported are the p-values.

**Denotes significance at 5% level.

VII. Summary

The contradictory results of the "means difference" tests make it difficult to draw any conclusions on the effect of tax law changes on dividend payout ratios. The Australian result is consistent with the prediction that assumes that investors avoided paying taxes before the tax law change. The direction of the change in dividend payout ratios for France is consistent with the prediction but the significance of the change is not confirmed by all three "means difference" tests. The paired t-test finds the change significant while the non-parametric tests find it insignificant. The changes in dividend payout ratios in Germany and U.S. are insignificant and inconsistent with the predictions. Japan's result is consistent with the predictions and the three "means difference" confirm the significance of the results. Dividend payout ratios declined in Japan after the tax law change. The results in this section are therefore inconclusive and no general inference can be made on the effect of tax law changes on dividend payout ratios.

CHAPTER 6

TAX EFFECTS HYPOTHESIS ON THE VALUE OF A FIRM

I. Introduction

Some authors believe that dividend policy affects the value of a firm because of tax effects. The tax effects hypothesis says that dividends have a negative effect on the value of a firm. In countries where capital gains are taxed at a lower rate than dividend income, firms that pay large dividends are expected to offer higher returns to compensate for the higher taxes paid on dividends. These firms therefore should have lower stock prices and firm values. The tax effects hypothesis therefore implies that the relationship between expected return and dividend yield should be positive in countries where dividend income is taxed at a higher rate than capital gains and negative in countries where capital gains are taxed at a higher rate than dividend income. The predictions made in the next section should hold if the tax effects hypothesis is valid.

II. Hypotheses

The tax calculations in Chapter 3 show that investors in all tax brackets in Japan and U.S. preferred unrealized capital gains to dividend income before and after the tax law changes. If the tax hypothesis is correct, we should expect to see a positive relationship between expected return and dividend yield in these countries before and after the tax law change.

The Australian tax calculations show that investors in all tax brackets preferred unrealized capital gains to dividend income before the tax law change if dividend taxes were paid but indifferent to both options if dividend taxes were not paid. This implies that there may be a positive or insignificant relationship between expected return and dividend yield before the tax law change. After the tax law change, investors in all tax brackets were indifferent to the dividend income and unrealized capital gains options. An insignificant relationship between expected return and dividend yield is therefore expected after the tax law change.

In France and Germany, some investors preferred dividend income while others preferred capital gains before and after the tax law change. This suggests that the relationship between expected return and dividend yield is ambiguous. The marginal investors will determine the relationship between the two variables. There should be a positive relationship between expected return and dividend yield if the marginal investors' effective tax rate on dividend income is higher than that on capital gains while there should be a negative

relationship if the marginal investors' effective tax rate on dividend income is lower than that on capital gains.

The coefficient of the dividend yield in the CAPM (discussed in the next section) is defined as the marginal effective tax difference between ordinary income and capital gains. If the tax law change increased the relative tax disadvantage associated with dividend income, the marginal tax difference between dividend income and capital gains should also increase. This change is expected because investors should demand a higher expected return to compensate for the higher tax difference between dividend income and capital gains. The dividend yield coefficient should therefore increase. Conversely, if the tax law change reduced the relative tax disadvantage of dividend income, the marginal tax difference should decrease and the dividend yield coefficient is expected to decrease.

In Australia, the expected change of the dividend yield coefficient depends on whether dividend income taxes were paid before the tax law change. If taxes were paid on dividend income, the tax calculations showed that the tax law change reduced the tax disadvantage of dividend income. This leads to the prediction that the coefficient on the dividend yield should decrease after the tax law change. However, if dividend income taxes were not paid, there should be an insignificant change in the dividend yield coefficient.

The tax calculations indicate that the tax law change increased the tax disadvantage of dividend income relative to capital gains for all investors in

France (except for investors in the lowest tax bracket) and Germany. It is therefore predicted that the dividend yield coefficient should increase after the tax law change in France and Germany.

The tax calculations also suggest that the tax law change increased the tax disadvantage of dividend income relative to capital gains for most investors in Japan and U.S. The dividend yield coefficient is therefore expected to increase in these countries after the tax law change.

III. Methodology

The use of the Capital Asset Pricing Model (CAPM) in testing the relationship between dividend yield and expected return has become a standard practice. Brennan (1970), Black and Scholes (1974), Miller and Scholes (1982), Litzenberger and Ramaswamy (1979 and 1982) used the CAPM to test this relationship.

The CAPM is an equilibrium asset pricing model that tries to establish a consistent relationship between risk and expected return. Securities that have high risk are expected to provide higher rates of return while those with low risk are expected to provide lower rates of return. The relevant risk in pricing securities is the systematic risk (market related risk) which cannot be diversified away. This model uses beta (β) to measure the systematic risk of a security. Beta is defined as the covariance between the asset return and the market return divided by the variance of the market return. The CAPM says that the

required rate of return on any security is a linear function of the beta of that security. The CAPM is usually expressed as:

$$E(R_{i,t}) = R_{f,t} + \beta_{i,t}[E(R_{m,t}) - R_{f,t}] \dots\dots\dots 4$$

where $E(R_{i,t})$ is the expected return on security i in period t ,

$R_{f,t}$ is the short term risk-free rate in period t ,

$\beta_{i,t}$ is the beta for security i in period t and

$E(R_{m,t})$ is the expected return on the market portfolio in period t .

Brennan (1970) extended the CAPM to incorporate the effects of personal taxes paid on dividends. His after-tax CAPM states that the expected return of a security is a function of the security's risk characteristics (beta) and its expected dividend yield. Brennan's after-tax CAPM is given as follows:

$$R_{i,t} - R_{f,t} = a_1 COV(R_{i,t}, R_{m,t}) + a_2 (DY_{i,t} - R_{f,t}) \dots\dots\dots 5$$

where $R_{i,t}$ is the rate of return on the i th security in period t ,

$R_{f,t}$ is the return on a risk-free asset in period t ,

a_1 is the marginal effect of risk in period t ,

$COV(R_{i,t}, R_{m,t})$ is the covariance of the security's return with the market's return in period t ,

a_2 is the marginal effective tax difference between ordinary income and capital gains rate and

$DY_{i,t}$ is the dividend yield in period t .

His interpretation of this model is that for a given level of risk, investors

require higher returns from securities that pay large dividends to compensate for the differential tax treatment between dividend income and capital gains.

The general after-tax CAPM equation used to test the relationship between the value of a firm and dividend policy is given as:

$$R_{i,t} - R_{f,t} = a_0 + a_1 \beta_{i,t} + a_2 (DY_{i,t} - R_{f,t}) + e_{i,t} \dots \dots \dots 6$$

where $R_{i,t}$ is the before-tax return on the i th security in period t ,

$R_{f,t}$ is the return on the risk-free asset in period t ,

a_0 is the constant term,

a_1 is the marginal effect of risk,

$\beta_{i,t}$ is the systematic risk of the i th security in period t ,

a_2 is the marginal effective tax difference between ordinary income and capital gains rate,

$DY_{i,t}$ is the dividend yield in period t and

$e_{i,t}$ is the error term in period t .

A complete derivation of this model is given in Brennan (1970) and Litzenberger and Ramaswamy (1979). The major assumptions that underlie the derivation of the model as detailed by Litzenberger and Ramaswamy (1979) are:

1. Investors are rational and risk averse and therefore maximize utility in a mean variance domain.
2. Security rates of return have a multivariate normal distribution.
3. Investors have homogenous expectations. This implies that investors have identical expectations in terms of expected return and variance

because they have the same information about all securities.

4. Transaction costs are insignificant.
5. There are no restrictions on short sales of securities. Investors can sell securities they do not own and use the proceeds to buy other securities.
6. Individuals are price takers. An individual's buying or selling action cannot affect the price of a stock.
7. All assets are marketable which implies that all assets, including human capital, can be bought and sold.
8. A riskless asset paying a constant rate exists. An investor can lend or borrow an unlimited amount of funds at the risk-free rate.
9. Dividends on securities are paid at the end of the period.
10. Income taxes are progressive and the marginal tax rate is a continuous function of taxable income.
11. There are no taxes on capital gains. This assumption is based on the fact that capital gains taxes are only paid if realized.

Some of these assumptions do not realistically describe the behavior of capital markets. However, the CAPM still holds if some of the assumptions are relaxed. Elton and Gruber show that the CAPM is very robust to the violation of some of the assumptions. They relaxed assumptions 3, 5, 6, 7 and 8 and are able to obtain similar results.

The first step in the CAPM is to estimate the beta of individual securities for the period of study. This is done by regressing the stock return in excess of

the risk-free rate ($R_f - R_{ff}$) on the excess return on the market portfolio ($R_{mt} - R_{ff}$). A portfolio of securities that is riskier than the market portfolio is expected to yield a higher return than the market return while one that is not as risky as the market portfolio should provide lower returns. The market portfolio is not observable, so proxies are used. The commonly used proxies are the New York Stock Exchange Index, the Standard and Poor's 500 Index, or the AMEX Index.

The second step is to regress the portfolio's excess return on the obtained beta and the difference between the dividend yield and the risk free rate ($DY_{it} - R_{ff}$). However, capturing risk with beta has received a lot of criticism (see Roll 1977). Some of the criticisms are as follows:

1. The true market portfolio is not observable and cannot be determined to be efficient or not.
2. Using proxies for the market portfolio may lead to inferences that are not necessarily true. The validity of the CAPM and the efficiency of the market portfolio is a joint hypothesis that is difficult to test because the market portfolio is not observable. If a particular test does not support the CAPM this may mean that the ex-post portfolio used to estimate beta is not efficient or that the predicted linear relationship between beta and expected return does not hold.
3. Beta does not explain most of the variation of the returns of securities.

These criticisms led to the search for alternative risk variables. Banz

(1981) suggests that the unexplained variation of a security's expected return can be explained by a size effect. Bhandari (1988) concludes that leverage is important in predicting expected return. Basu (1983) claims that the earnings-price (E/P) ratio is an important factor in evaluating the variations in expected returns. Rosenberg, Reid, and Lanstein (1985) and Chan, Hamao, and Lakonishok (1991) conclude that the ratio of a firm's book value of common equity (BE) to its market value of equity (ME) explains the variation of expected returns better than beta.

Fama and French (1992) evaluate all the risk variables suggested above. Their major conclusions are:

1. The performance of the beta-based regression is poor and unstable over time.
2. The size of the firm measured by the market value of equity and the book-to-market value of equity explain the variation of expected returns on NYSE, AMEX, and NASDAQ better than beta.
3. The ratio of book-to-market value of equity had a higher explanatory power than the size variable.

Based on the above results, a modified version of the after-tax CAPM is used in this study. The risk variables are size (measured by the market value of equity) and the ratio of book-to-market value of equity. The market value of equity is defined as the number of outstanding shares multiplied by the price of the stock. Market value is a proxy for firm size. The size effect has received

considerable attention in the literature with the documentation of a negative relationship between size and returns. Smaller firms offer higher expected returns than bigger firms. This has been attributed to the fact that smaller firms are less stable and therefore viewed by investors as being more risky. In order to attract investors, smaller firms must offer higher expected returns. Therefore the relationship between size and expected return should be negative.

The other risk variable is the ratio of book value of equity to market value of equity (BE/ME). This variable can be used to measure the performance of firms. A low (BE/ME) ratio means that the market value is greater than the book value of common equity and is an indication that the firm is doing well. On the other hand, a high ratio means that the firm's stock price is low and may be a sign that the firm is in distress. Fama and French (1992) suggest that the risk captured by the (BE/ME) ratio may be the relative distress factor presented in Chan and Chen (1991). The relationship between this risk variable and returns is expected to be positive.

Univariate and multivariate cross sectional regressions are run with the two risk variables. The models are as follows:

$$R_{i,t} - R_{f,t} = a_0 + a_1 ME_{i,t} + a_2 (DY_{i,t} - R_{f,t}) + e_{i,t} \dots \dots \dots 7$$

$$R_{i,t} - R_{f,t} = b_0 + b_1 \frac{BE_{i,t}}{ME_{i,t}} + b_2 (DY_{i,t} - R_{f,t}) + u_{i,t} \dots \dots \dots 8$$

$$R_{i,t} - R_{f,t} = \alpha_0 + \alpha_1 ME_{i,t} + \alpha_2 \frac{BE_{i,t}}{ME_{i,t}} + \alpha_3 (DY_{i,t} - R_{f,t}) + n_{i,t} \dots \dots \dots 9$$

where $R_{i,t}$ is the before-tax return on the i th security in period t ,

$R_{f,t}$ is the return on the risk-free asset in period t ,

a_0 , b_0 and α_0 are the constant terms,

a_1 , b_1 , α_1 and α_2 are the marginal risk effects,

$ME_{i,t}$ is the market value of equity in period t ,

$BE_{i,t}$ is the book value of equity in period t ,

a_2 , b_2 and α_3 are the marginal effective tax differences between ordinary income and capital gains rates,

$DY_{i,t}$ is the expected dividend yield in period t , and

$e_{i,t}$, $u_{i,t}$ and $n_{i,t}$ are the error terms.

Annual dividend yields are used in the regressions and they are defined as the annual dividend per share divided by the stock price at the end of the fiscal year. The expected dividend yield for year t is the dividend yield of the previous year. The annual dividend yield has the advantage of ensuring that any price adjustments, information, or tax accrual effects must have had time to stabilize.

Jose and Stevens (1989) argue that there is a possibility that tax effects accrue gradually over a period of time. The use of short run measures (such as the quarterly dividend yield) may therefore lead to erroneous results that only reflect short run price adjustments that are not permanent. The market value of equity is the value at the end of the fiscal year.

Cross sectional regressions are run for the pre and post tax law periods and for the nine-year period in each country using Ordinary Least Squares and the Maximum Likelihood Estimation. Regressions by Black and Scholes (1974), Litzenberger, R.H. and K. Ramaswamy (1979, 1982), etc., grouped securities into portfolios in order to reduce the estimation error and the non-stationarity problems associated with estimated beta. This portfolio grouping is not necessary in this study since beta is not being used.

V. Results

The results of the regressions for the entire period (1984 - 1991) are given in Table 12¹¹. The relationship between dividend yield and expected return is positive for France, Germany, Japan and U.S. This relationship is significant in the three models. Australia is the only country with an insignificant relationship between dividend yield and expected return. The coefficients of market value of equity are negative while the coefficients of the ratio of book-to-

¹¹These are Maximum Likelihood Estimation results. There is no significant difference between these results and the Ordinary Least Squares results.

market value of equity are positive for all countries. These are the expected signs and most of the coefficients are significant.

The pre and post tax law regression results are shown in Table 13. The dividend yield coefficients are positive and significant in France, Japan and the U.S. both before and after the tax law change in the univariate and multivariate regressions. The relationship between dividend yield and expected return in Australia is insignificant before and after the tax law change. There is an insignificant relationship between expected return and dividend yield in Germany before the tax law change. After the tax law change, this relationship is positive and significant in the univariate regressions but only significant at the 15% level in the multivariate regression.

The pre and post tax law regressions results show that the change in dividend yield coefficient in Japan and U.S. is insignificant in the three regressions and inconsistent with the prediction. The change in the dividend yield coefficient for France and Germany is significant¹² in all the three regressions and is consistent with the prediction. The insignificant change in the coefficient for Australia is also consistent with the prediction that assumes that there was widespread evasion of taxes before the tax law change. These

¹²The formula used to test for significance of a change in the dividend yield coefficient is given as $Z = (\beta_2 - \beta_1) / (s_{\beta_2}^2 - s_{\beta_1}^2)$ where Z is approximately normally distributed because the number of firms is large in the countries. β_2 and β_1 are the post and pre tax law dividend yield coefficients while $s_{\beta_2}^2$ and $s_{\beta_1}^2$ are the estimated standard errors.

results are generally consistent with the predictions about the change in the dividend yield coefficients.

Table 13: Regressions of Expected Return on Market Value of Equity, Ratio of Book-to-Market Value of Equity and Dividend Yield Between 1984 and 1991

Country	Coeff. of DY	Coeff. of ME	Coeff. of BE/ME
Australia	-0.18 (-0.46)	-0.08 (-4.05)	0.25 (5.03)
	-0.40 (-1.07)		
	-0.32 (-0.86)		
France	6.21 (5.86)	-0.12 (-7.00)	0.24 (6.79)
	5.07 (4.72)		
	5.52 (5.16)		
Germany	3.49 (5.22)	-0.04 (-3.54)	0.15 (4.88)
	2.58 (3.71)		
	2.52 (3.66)		
Japan	8.59 (14.28)	-0.06 (-6.86)	0.13 (7.36)
	8.11 (13.16)		
	7.64 (12.31)		

Table 13 Continued

Country	Coeff. of DY	Coeff. of ME	Coeff. of BE/ME
U.S.	3.19 (2.00)	-0.04 (-1.94)	
	2.94 (8.22)		0.03 (1.92)
	3.13 (8.07)		0.02 (1.15)

T-statistics in parentheses

Coeff. of DY is the coefficient of dividend yield.

Coeff. of ME is the coefficient of market value of equity.

Coeff. of BE/ME is the coefficient of the ratio of book-to-market value of equity.

TABLE 14: Pre and Post Tax Law Regressions of Expected Return on Market Value of Equity, Ratio of Book-to-Market Value of Equity and Dividend Yield (1984-1991)

Country	Pre-Tax Law Period			Post-Tax Law Period		
	DY	ME	BE/ME	DY	ME	BE/ME
Australia	-0.12 (-0.12)	-0.11 (-2.87)		-0.12 (-0.28)	-0.04 (-1.47)	
	0.31 (0.36)		0.19 (1.92)	-0.38 (-0.88)		0.24 (3.25)
	-0.48 (-0.47)	-0.10 (-2.55)	0.14 (1.42)	-0.35 (-0.80)	-0.03 (-0.86)	0.22 (3.00)
France	4.80 (3.06)	-0.12 (-4.68)		6.88 (6.22)	-0.03 (-1.49)	
	4.10 (2.61)		0.24 (4.94)	6.21 (5.36)		0.04 (0.77)
	4.54 (2.89)	-0.08 (-2.41)	0.15 (2.57)	6.39 (5.50)	-0.03 (-1.54)	0.02 (0.34)
Germany	-0.48 (-0.43)	-0.03 (-2.45)		2.87 (2.09)	-0.02 (-0.95)	
	-1.92 (-1.34)		0.19 (5.19)	1.97 (1.73)		0.04 (0.98)
	-1.74 (-1.37)	-0.02 (-1.79)	0.18 (4.89)	2.28 (1.51)	-0.02 (-0.94)	0.04 (0.97)
Japan	4.51 (4.37)	-0.04 (-3.38)		2.51 (4.21)	-0.10 (-7.86)	
	3.73 (3.59)		0.11 (4.87)	1.32 (5.73)		0.17 (6.45)
	3.86 (3.71)	-0.02 (-1.86)	0.09 (3.96)	3.51 (5.43)	-0.09 (-7.70)	0.16 (6.26)

Table 14 Continued

Country	Pre-Tax Law Period			Post-Tax Law Period		
	DY	ME	BE/ME	DY	ME	BE/ME
U.S.	5.03 (1.23)	-0.10 (-1.71)		2.71 (5.08)	-0.01 (-1.70)	
	4.16 (9.33)		-0.05 (-2.84)	2.27 (4.35)		0.06 (3.28)
	4.47 (9.24)	-0.01 (-1.64)	-0.06 (-3.20)	2.30 (4.09)	-0.001 (-0.12)	0.06 (2.74)

T-statistics in parentheses

DY is the coefficient of dividend yield.

ME is the coefficient of market value of equity.

BE/ME is the coefficient of the ratio of book-to-market value of equity.

IV. Interpretation of Results

The results show that there is a positive and significant relationship between expected return and dividend yield in France, Germany, Japan and U.S. for the whole period. These results imply that stocks that pay high dividends generally have low stock prices. This is consistent with the tax effects hypothesis. The Australian cross sectional regression reveals an insignificant relationship between expected return and dividend yield. The Australian investors expect comparable returns from stocks that pay high or low dividends.

The focus of this study is on the relationship between expected returns and dividend yield before and after the tax law change. The results show that there is an insignificant relationship between expected return and dividend yield before and after the tax law change in Australia. The insignificant relation between expected return before the tax law change is consistent with the prediction that assumes taxes on dividend income were not paid before the tax law change. This insignificant relationship suggests that the high tax rate on dividend income was of no consequence since these taxes were not paid. The insignificant relationship after the tax law change is expected and is consistent with the tax effects hypothesis.

The positive and significant dividend yield coefficients obtained for Japan and U.S. before and after the tax law change is also consistent with the predictions of the tax effects hypothesis. These results suggest that investors

demand higher returns from stocks that pay high dividends. This also implies that dividends have a negative effect on the value of a firm.

The positive relationship found between expected return and dividend yield in France and Germany supports the tax effects hypothesis and also suggests that marginal investors may be in the higher tax brackets. The tax calculations show that the relationship between expected return and dividend yield in France and Germany is ambiguous because some investors preferred dividend income while others preferred capital gains. Investors in the lower tax brackets were better off with dividend income than capital gains while investors in the higher tax brackets were better off with capital gains in France before and after the tax law change. If the marginal investors are in lower tax brackets, the relationship between expected return and dividend yield should have been negative. But the results reveal a positive relationship between the two variables before and after the tax law change which implies that the marginal investor may be in the higher tax brackets. In Germany, the relationship between expected return before the tax law change should be insignificant if the marginal investor is in the top tax bracket because the effective tax rate on dividend income and capital gains are the same in this tax bracket. However, the relationship between the two variables should be positive after the tax law change, if the marginal investor is in the higher tax brackets. The results show that the relationship expected return and dividend yield is insignificant before the tax law change and positive and significant at the 15% level after the tax law

change.

It is also interesting to observe that there is a shift in the dividend yield coefficients after the tax law change. In France and Germany, there is a significant increase in the coefficient of dividend yield and these are two of the four countries that increased the tax disadvantage associated with dividend income after the tax law change. The change in the dividend yield coefficient for Australia is insignificant. This is the country where the tax law change did not significantly change the tax position of investors if it is assumed that taxes were not paid. The changes in the dividend yield coefficient for Japan and U.S are insignificant and are inconsistent with the predictions.

The results of the changes in the dividend yield coefficients are also consistent with Poterba and Summers (1984) that conclude that the 1973 change in dividend taxation in Britain had a substantial effect on the premium required by investors on firms that paid high dividends. Investors demanded a higher expected return after a tax law change that increased the tax disadvantage of dividend income was introduced. Ang, Blackwell and Megginson (1991) also report that in Britain, stocks sold at a premium before the tax law change when the tax law favored capital gains. However, the same stocks sold at a discount when a tax law change that reduced the tax advantage of capital gains was introduced.

The coefficients of market value of equity and the ratio of book-to-market value of equity have the expected signs in all the countries. Market value of

equity has a negative and significant relationship with expected return and this is consistent with the results of Fama and French (1992). Smaller firms are perceived to be risky and therefore generally have higher expected returns. The coefficients of the ratio of book-to-market value of equity are positive and significant. Firms that have low (BE/ME) ratios provide lower expected returns because they are perceived to be doing well. Firms that have high (BE/ME) ratios, on the other hand, are perceived as distressed firms and need to offer higher returns to attract investors. These two risk variables are significant in explaining the expected return on stocks with the ratio of (BE/ME) generally having a higher explanatory power.

V. Summary

The results of this section provide evidence in support of the tax effects hypothesis. The relationship between expected return and dividend yield is positive and significant in France, Japan and U.S. These are countries that tax dividend income at a higher rate than capital gains. On the other hand, the relationship between expected return and dividend yield is insignificant in Australia and Germany (before the tax law change). Investors in these countries were indifferent to the dividend income and unrealized capital gains options because the two options were taxed at the same rate. The conclusion is further strengthened by the results of the changes in the coefficient of dividend yield. The dividend yield coefficient increased in France and Germany

which are two of the four countries that increased the tax disadvantage of dividend income. The change in the yield coefficient in Australia is insignificant and this is the expected result because the tax law change did not change the tax position of investors. The results also suggest that the marginal investors may be in the top tax brackets.

CHAPTER 7

LINTNER'S PARTIAL ADJUSTMENT MODEL

I. Introduction

Lintner (1956) derives a dividend behavioral model that is used to describe the dividend behavior of U.S. firms. The last part of this work evaluates how well Lintner's partial adjustment model describes the dividend behavior of firms in other countries.

II. Methodology

Lintner (1956) examines the variables that influence the dividend policies of firms. His findings indicate that firms have long term target dividend payout ratios; the dividend change from year to year is more important than the absolute amount of dividends paid in a given year; and that managers are reluctant to make dividend changes that may have to be reversed within a short period. Lintner used these findings to develop a partial adjustment model.

Lintner's model is given as:

$$\Delta D_{i,t} = a_i + c_i (D_{i,t}^* - D_{i,t-1}) + u_{i,t} \dots \dots \dots 10$$

where $\Delta D_{i,t}$ is the change in dividends for firm i in period t,

c_i is the speed of adjustment to the difference between a target dividend payout and last year's payout,

$D_{i,t}^*$ is the target dividend payout in period t,

$D_{i,t-1}$ is last period's dividend payout in period t-1,

a_i is the constant term and

$u_{i,t}$ is a normally distributed random error.

$$D_{i,t}^* = r_{i,t} y_{i,t} \dots \dots \dots 11$$

where $r_{i,t}$ is the desired payout ratio in period t and

$y_{i,t}$ is the current earnings.

This equation says that the amount of dividends paid in a given year is a proportion of the earnings for that year. This implies that firms adjust partially to changes in earnings while determining the amount of dividends to be paid.

Equation 10 can be written as:

$$\Delta D_{i,t} = a_i + c_i r_{i,t} y_{i,t} - c_i D_{i,t-1} + u_{i,t} \dots \dots \dots 12$$

The actual regression used by Lintner is

$$D_{i,t} = b_1 + b_2 Y_{i,t} - b_3 D_{i,t-1} + u_{i,t} \dots \dots \dots 13$$

From equation (13) the partial adjustment coefficient (speed of adjustment) and the long-run payout ratios can be calculated. The partial adjustment coefficient reflects how fast a firm adjusts its dividend payment toward the target ratio. The partial adjustment coefficient and long run payout ratio are as follows:

The partial adjustment coefficient = $1 - b_2$ ¹³

The long run payout ratio = $b_1/(1 - b_2)$.

Estimation intervals are obtained for the speed of adjustment. These intervals are used to calculate a range for the calculated payout ratios to account for estimation errors.

Nakamura and Nakamura (1989) claim that the addition of a size variable improves the forecasting ability of Lintner's model. A size variable measured by market value of equity is therefore added in Lintner's partial adjustment as a second model. This model is given as:

$$D_{i,t} = b_0 + b_1 Y_{i,t} - b_2 D_{i,t-1} + b_3 ME_{i,t} + u_{i,t} \dots \dots \dots 14$$

where $D_{i,t}$ is the current dividends for firm i in period t,

$Y_{i,t}$ is the current earnings for firm i in period t,

$D_{i,t-1}$ is last period's dividend payout for firm i,

$ME_{i,t}$ is the market value of equity for firm i in period t,

¹³ b_2 is the coefficient of dividends per share and b_1 is the coefficient of earnings per share.

b_0 is the constant term and

$u_{i,t}$ is a normally distributed random error.

Earning per share (EPS) and cash flow per share (CFS) are used in the two models. The cash flow variable is used to test Brittain's claim that the use of cash flow provides a better predictive power than the use of earnings per share in Lintner's model.

III. Results

The results of the partial adjustment models for each country are given in Table 14. Lintner's model is able to explain 64.86% of the dividend behavior in Australia, 80.49% in France, 62.81% in Germany, 91.67% in Japan and 88.01% in U.S. The cash flow model explains 40.61% of the dividend behavior in Australia, 78.60% in France, 59.53% in Germany, and 88.97% in U.S. The earnings per share model that incorporates a size variable explains 64.76% of dividend behavior in Australia, 80.56% in France, 63.52% in Germany, 91.69% in Japan and 88.85% in U.S., while the cash flow counterpart explains 43.16% in Australia, 78.83% in France, 60.58% in Germany, and 88.97% in U.S. The cash flow model was not run in Japan because of a lack of complete data for cash flows. The reported coefficients of correlation (R^2) are the adjusted R^2 .

Table 15: Regressions of the Partial Adjustment Models

COUNTRY	INT	DSLAG1	EPS	CFS	ME	R ²	DW
Australia	0.01	0.68	0.19			64.86%	2.14
	-0.01	0.68	0.19		0.002	64.76%	2.15
	0.02	0.56		0.099		40.61%	2.19
	-0.33	0.54		0.075	0.028	43.16%	2.19
France	1.36	0.92	0.02			80.49%	1.94
	-4.36	0.91	0.02		0.393	80.56%	1.94
	1.14	0.94		0.006		78.60%	1.90
	-7.72	0.92		0.001	0.61	78.83%	1.90
Germany	1.41	0.70	0.07			62.81%	2.11
	-2.34	0.68	0.06		0.294	63.52%	2.13
	1.32	0.75		0.013		59.53%	2.10
	-3.27	0.72		0.008	0.368	60.58%	2.13
Japan	0.51	0.91	0.02			91.67%	1.99
	-1.15	0.90	0.02			91.69%	1.99
U.S.	0.05	0.93	0.01			88.01%	2.02
	-0.41	0.87	0.01		-0.013	88.85%	2.01
	0.07	0.99		-0.013		87.71%	2.03
	-0.51	0.93		-0.013	-0.013	88.97%	2.00

INT is the intercept of the regression
DSLAG1 is the lag of dividends per share
EPS is earnings per share
CFS is cash flow per share
ME is the market value of equity
R² is the adjusted coefficient of determination
DW is the Durbin-Watson statistics.

The calculated long term payout ratios and the speed of adjustment for the five countries are given in Table 15. The speed of adjustments for Australia, France, Germany, Japan and U.S are 32%, 8%, 30%, 9% and 7% respectively. The estimation interval for the speed of adjustment is (21%-43%) for Australia; (7%-23%) for France; (13%-48%) for Germany; (7%-25%) for Japan and (3%-11%) for U.S. The calculated long term payout ratios are 59.38% (44%-88%)¹⁴ for Australia; 25% (9%-29%) for France; 23% (15%-54%) for Germany; 22.22% (8%-28%) for Japan and 28.57% (9%-33%) for U.S¹⁵.

¹⁴The numbers in parentheses are the calculated range for the payout ratios.

¹⁵The range for the payout ratios are calculated by dividing the coefficients of the earnings variable obtained in Lintner's model by the upper and lower limits obtained for the estimation interval of the speed of adjustments.

Table 16: Coefficients of Partial Adjustment and Speed of Adjustment

Country	b1	b2	Speed of Adjustment	Long Run Payout Ratio
Australia	0.19	0.68	32.0%	59.38%
France	0.02	0.92	8.0%	25.00%
Germany	0.07	0.70	30.0%	23.00%
Japan	0.02	0.91	9.0%	22.22%
U.S.	0.01	0.93	7.0%	28.57%

b_1 is the coefficient of earnings per share

b_2 is the coefficient of dividends per share

Speed of adjustment = $1 - b_2$

Long run payout ratio = $b_1 / (1 - b_2)$.

IV. Interpretation of Results

For all countries, the predictive power of the earnings per share models are slightly higher than those of the cash flow models except in Australia where the EPS model has a significantly higher R^2 . This is contrary to Brittain's results that conclude that cash flow models have better predictive power than earnings per share models.

The intercepts in the regressions are positive. This is consistent with Lintner's results which show that the intercepts are positive to reflect the fact that firms are very reluctant to cut dividend payments. The earnings per share variable and last year's dividend are the most significant factors in explaining the dividend policy of firms. The size variable does not add very much to the explanatory power of the regressions.

The calculated payout ratios for Australia, France and U.S. are not significantly different from the actual payout ratios but for Germany and Japan, the calculated payout ratios are lower than the actual payout ratios. The payout ratios are, however, within the calculated range.

Australia's and Germany's speed of adjustments are the highest among the five countries. This means that these countries adjust their dividend payments very quickly to changes in earnings.

CHAPTER 8

SUMMARY AND CONCLUSIONS

I. Summary

There are some significant differences in dividend payout ratios, dividend yields and dividend growth rates between Australia, France, Germany, Japan and United States between 1983 and 1991. Australia has the highest dividend payout ratios, dividend yield and dividend growth rates. The French dividend payout ratios are the lowest while the Japanese dividend yield and dividend growth rates are the lowest.

The tax effects hypothesis is used to make predictions on the effects of tax law changes on dividend payout ratios. It is predicted that the payout ratios in France, Germany, Japan and U.S. should decrease while there should be an no significant change in the payout ratios in Australia if it is assumed that dividend income taxes were not paid before the tax law change. The paired t-test, the Sign test and the Wilcoxon sign rank tests are used to test for significant changes after the tax law change. The results show that there were insignificant changes in dividend payout ratios in Australia, Germany and U.S. The dividend payout ratios decreased in France but the three tests used to test

for significant changes provide contradictory results which makes it difficult to make any general inferences. There was also a significant decrease in dividend payout ratios in Japan and the three tests confirm this significance. The results of the effects of tax law changes on dividend payout ratios are therefore generally inconclusive.

The dividend payout ratios were also adjusted for macro economic effects by using interest rates as a covariate and the means of the adjusted and unadjusted payout ratios are similar. This suggests that interest rates do not affect payout ratios.

The validity of the tax effects hypothesis is also tested by examining the relationship between expected return and dividend yield using a modified Capital Asset Pricing Model. The relationship between expected return and dividend yield in Japan and U.S. before and after the tax law change is positive and significant. These countries have higher total effective tax rates on dividend income than on capital gains. The relationship between expected return and dividend yield is insignificant in Australia before and after the tax law change. This is also consistent with the tax effects hypothesis because shareholders in Australia are supposed to be indifferent to dividend income or capital gains if they do not pay dividend income taxes. The insignificant relationship in Germany (before the tax law change) and the positive relationship in France and Germany (after the tax law change) suggest that the marginal investors may be in the top tax bracket.

The results also show that there is a shift in dividend yield coefficient. The coefficient increased significantly in France and Germany after the tax law change when the tax disadvantage of dividend income increased. The changes in the dividend yield coefficient for Australia, Japan and U.S. are insignificant.

These results therefore generally support the tax effects hypothesis. Countries with higher effective tax rates on dividend income have a positive relationship between expected return and dividend yield. This suggests that dividends have a negative effect on the value of a firm.

Lintner's partial adjustment model is able to explain the dividend behavior of firms in countries other than U.S. The addition of a size variable does not add very much to the explanatory power of the regressions even though the coefficient of the size variable is significant. The calculated payout ratios for Australia, France and U.S. are not significantly different from the actual payout ratios. The calculated payout ratios for Germany and Japan are lower than the actual payout ratios but are within the calculated range of payout ratios. Australia and Germany have the highest speed of adjustments among the five countries suggesting that they adjust their dividend payments very quickly to changes in earnings. Brittain's claim that the use of a cash flow variable improves the predictive power of Lintner's model is not substantiated in this study.

II. Practical Implications for Research Results

The results of this study support the notion that tax policies may have significant impact on economic stability and growth through their effects on corporate retention or payout. France, Japan and Germany increased the tax advantage accorded capital gains after the tax law change and the dividend payout ratios in these countries decreased even though insignificantly in some cases. Australia did not significantly change the tax position of investors and there was no significant change in the payout ratios. These results suggest that the tax policy instituted by a country may change the dividend pattern of firms if there is enough incentives to do so. Countries can therefore use tax policies to promote economic growth. A policy that encourages capital gains and discourages dividend payments may lead to economic growth.

The results of this study also provide evidence consistent with the hypothesis that dividends have a negative effect on the value of the firm. The implication for wealth maximizing firms is to pay less dividends.

III. Limitations of the Study

The predictions made in this study are based purely on tax considerations. The selection of countries that changed their system in the period provides a unique opportunity to validate the tax effects hypothesis. However, it is still possible that other factors interact with these tax effects.

Another limitation is the length of time. The use of a longer number of

years is desirable but this is not possible with this study. Other studies have used fewer number of years.

The third limitation which is common to other studies is that the firms used are successful firms who were in operation during the entire nine-year period. The study did not allow for failures in the sample but this is usually done to allow for continuity.

IV. Suggestions for Further Research

The generally negative effect of dividend policy on the value of a firm found in this study needs to be adequately examined by incorporating other factors. The tax calculations show that in the absolute sense no dividends should be paid in Australia, France, Japan and U.S. because shareholders are better off with capital gains than dividend income. Dividends are, however, paid in these countries, an indication that there are other factors apart from taxes that affect the dividend policy of firms. A more conclusive result may be obtained by simultaneously integrating tax effects, information effects and agency effects.

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APPENDIX A

These tax calculations are based on the following assumptions:

1. Tax payers are in the top marginal tax bracket
2. Tax payers are in the top capital gains tax bracket
3. Tax payers only face federal government tax

Notations:

T is the corporate tax rate on distributed profit,

T^R is the corporate tax rate on retained profit,

M is the personal tax rate,

g is the capital gains tax rate and

c is the partial credit rate.

AUSTRALIA BEFORE 1987

Corporate tax rate:	46.00%
Personal tax rate on dividends:	60.00%
Capital gains tax rate:	60.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability	=	T
Personal tax liability	=	(1 - T)M
Total tax liability	=	T + (1 - T)M
	=	0.46 + 0.3240
Effective tax rate	=	78.40%

Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But Capital Gains Are Realized

Corporate tax liability	=	T
Personal tax liability	=	(1-T)g
Total tax liability	=	T + (1-T)g*
	=	0.46 + 0.3240
Effective tax rate	=	78.40%

* In Australia $m = g$ before and after the tax law change.

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate Tax Liability	=	T
Personal Tax Liability	=	0
Total Tax Liability	=	T
	=	0.46
Effective Tax Rate	=	46.0%

AUSTRALIA AFTER 1987

Corporate tax rate:	49.00%
Personal tax rate on dividends:	48.30%
Personal tax rate on capital gains:	48.30%

**Scenario 1: All Corporate Earnings Are Paid Out To Shareholders
As Dividends**

Corporate tax liability	=	T
Personal tax liability	=	$[(1 - T) + T]M - T = (M - T)$
Total tax liability	=	$T + (M - T)$
	=	0.49**
Effective tax rate	=	49.00%

** Total tax liability in Australia is M (if $M > T$) and T (if $M < T$), but the highest marginal tax rate is 48.3% which is less than T. This means that effectively total tax liability is T.

**Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But
Capital Gains Are Realized**

Corporate tax liability	=	T
Personal tax liability	=	0
Total tax liability	=	T
	=	0.49
Effective tax rate	=	49.00%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate Tax Liability	=	T
Personal Tax Liability	=	0
Total Tax Liability	=	T
	=	0.49
Effective Tax Rate	=	49.00%

FRANCE BEFORE THE 1989 TAX LAW CHANGE

Corporate tax rate:	50.00%
Personal tax rate on dividends:	57.90%
Personal tax rate on capital gains:	15.00%
Partial credit rate:	50.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability	=	T
Personal tax liability	=	$[(1-T) + c(1-T)]M - c(1-T)$
	=	$[M + Mc - c][1 - T]$
Total tax liability	=	$T + [M + Mc - c][1 - T]$
	=	$0.50 + 0.1843$
Effective tax rate	=	68.43%

Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But Capital Gains Are Realized

Corporate tax liability	=	T
Personal tax liability	=	$(1-T)g^*$
Total tax liability	=	$T + (1-T)g$
	=	$0.50 + 0.075$
Effective Tax Rate	=	57.50%

* The 15% capital gains tax rate in France is a flat rate that applies if the proceeds from the sale of shares exceed FF251,500 (equivalent to \$41,508 in 1988) per year or if the shareholder holds more than 25% of the shares in a company. However, if the capital gains taxes are not paid this will not change the hypothesis because it will only affect the realized capital gains option.

Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And Capital Gains Are Not Realized

Corporate Tax Liability	=	T
Personal Tax Liability	=	0
Total Tax Liability	=	T
	=	0.50
Effective Tax Rate	=	50.00%

FRANCE AFTER THE 1989 TAX LAW CHANGE

Corporate tax rate on distributed profit:	42.00%
Corporate tax rate on retained profit (T^R):	34.00%
Personal tax rate on dividends:	57.90%
Personal tax rate on capital gains:	18.10%
Partial credit rate:	50.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability	=	T
Personal tax liability	=	$[(1-T) + c(1-T)]M - c(1-T)$
	=	$[M + Mc - c][1 - T]$
Total tax liability	=	$T + [M + Mc - c][1 - T]$
	=	0.42 + 0.2137
Effective tax rate	=	63.37%

**Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But
Capital Gains Are Realized**

Corporate tax liability	=	T^R
Personal tax liability	=	$(1 - T^R)g$
Total tax liability	=	$T^R + (1 - T^R)g^*$
	=	0.34 + 0.1195
Effective tax rate	=	45.95%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	0.34
Effective tax rate	=	34.00%

* The 18.1% capital gains tax rate in France is a flat rate that applies if the proceeds from the sale of shares exceed FF307,600 (equivalent to \$53,246 in 1989) per year or if the shareholder holds more than 25% of the shares in a company.

GERMANY BEFORE 1990

Corporate tax rate on distributed profit:	36.00%
Corporate tax rate on retained profit (T^R):	56.00%
Personal tax rate on dividends:	56.00%
Personal tax rate on capital gains:	0.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability	=	T
Personal tax liability	=	$[(1 - T) + T]M - T$
	=	$M - T$
Total tax liability	=	$T + (M - T)$
	=	M
	=	0.56
Effective tax rate	=	56.00%

Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But Capital Gains Are Realized

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	0.56
Effective tax rate	=	56.00%

Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And Capital Gains Are Not Realized

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	56
Effective tax rate	=	56.00%

GERMANY AFTER THE TAX LAW CHANGE

Corporate tax rate on distributed profit:	36.00%
Corporate tax rate on retained profit (T^R):	50.00%
Personal tax rate on dividends:	53.00%
Personal tax rate on capital gains:	0.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability	=	T
Personal tax liability:	=	$[(1 - T) + T]M - T$
	=	$M - T$
Total tax liability	=	$T + (M - T)$
	=	M
	=	0.53
Effective tax rate	=	53.00%

**Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But
Capital Gains Are Realized**

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	0.50
Effective tax rate	=	50.00%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	0.50
Effective tax rate	=	50.00%

JAPAN BEFORE APRIL 1990

Corporate tax rate on distributed profit:	32.00%
Corporate tax rate on retained profit (T^R):	42.00%
Personal tax rate on dividends:	57.00%
Personal tax rate on capital gains:	0.00%
Partial credit rate:	5.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability	=	T
Personal tax liability	=	$(1-T)M - c(1-T)$
	=	$(M - c)(1-T)$
Total tax liability	=	$T + (M - c)(1-T)$
	=	$0.32 + 0.3536$
Effective tax rate	=	67.36%

Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But Capital Gains Are Realized

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	0.42
Effective tax rate	=	42.00%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate tax liability	=	T^R
Personal tax liability	=	0
Total tax liability	=	T^R
	=	0.42
Effective tax rate	=	42.00%

JAPAN AFTER APRIL 1990

Corporate tax rate:	37.50%
Personal tax rate on dividends:	35.00%
Personal tax rate on capital gains:	20.00%*
Partial credit rate:	5.00%

**Scenario 1: All Corporate Earnings Are Paid Out To Shareholders
As Dividends**

Corporate tax liability	=	T
Personal tax liability	=	$[(1-T)]M - c(1-T)$
	=	$(M - c)(1-T)$
Total tax liability	=	$T + (M - c)(1 - T)$
	=	$0.375 + 0.1875$
Effective tax rate	=	56.25%

*The 20% capital gains tax rate in Japan is a flat rate.

**Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But
Capital Gains Are Realized**

Corporate tax liability	=	T
Personal tax liability	=	$(1 - T)g$
Total tax liability	=	$T + (1-T)g$
	=	0.375 + 0.125
Effective tax rate	=	50.00%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate tax liability	=	T
Personal tax liability	=	0
Total tax liability	=	T
	=	0.375
Effective tax rate	=	37.50%

U.S. BEFORE 1986

Corporate tax rate:	46.00%
Personal tax rate on dividends:	50.00%
Capital gains tax rate:	20.00%

Scenario 1: All Corporate Earnings Are Paid Out To Shareholders As Dividends

Corporate tax liability:	=	T
Personal tax liability	=	$(1 - T)M$
Total tax liability	=	$T + (1 - T)M$
	=	$0.46 + 0.27$
Effective tax rate	=	73.00%

Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But Capital Gains Are Realized

Corporate tax liability	=	T
Personal tax liability	=	$(1 - T)g$
Total tax liability	=	$T + (1 - T)g$
	=	$0.46 + 0.108$
Effective tax rate	=	56.80%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate tax liability	=	T
Personal tax liability	=	0
Total tax liability	=	T
	=	0.46
Effective tax rate	=	46.0%

U.S. AFTER 1986

Corporate tax rate:	34.00%
Personal tax rate on dividends:	31.00%
Capital gains tax rate:	31.00%

**Scenario 1: All Corporate Earnings Are Paid Out To Shareholders
As Dividends**

Corporate tax liability	=	T
Personal tax liability	=	(1 - T)M
Total tax liability	=	T + (1 - T)M
	=	0.34 + 0.2046
Effective tax rate	=	54.46%

**Scenario 2: Corporate Earnings Are Not Paid Out As Dividends But
Capital Gains Are Realized**

Corporate Tax Liability	=	T
Personal Tax Liability	=	$(1-T)g$
Total Tax Liability	=	$T + (1 - T)g$
	=	0.34 + 0.2046
Effective Tax Rate	=	54.46%

**Scenario 3: Corporate Earnings Are Not Paid Out As Dividends And
Capital Gains Are Not Realized**

Corporate tax liability	=	T
Personal tax liability	=	0
Total tax liability	=	T
	=	0.34
Effective tax rate	=	34.0%

AUTOBIOGRAPHICAL STATEMENT

Chinwe Edna Nweke was born August 14, 1958, in Nigeria to Hart Olekanma and Penninah Nkechinyere Adighmadu. She is married to Dr. Anthony C. Nweke and has four children: Amaka, Charles, Tony and Chichi Nweke.

Mrs. Nweke graduated Summa Cum Laude from The University of the District of Columbia with a Bachelors of Business Administration in December 1987.

Mrs. Nweke began her graduate program in Old Dominion University in 1989. She obtained a Masters of Arts in Economics in December 1990. After receiving her Masters degree, Mrs. Nweke continued her graduate studies by pursuing a doctorate in Finance. She held Graduate Research and Teaching Assistantships in the College of Business and Public Administration at Old Dominion University. Mrs. Nweke was the Doctoral Level Outstanding Student of the College of Business and Public Administration for the 1992 - 1993 academic session.